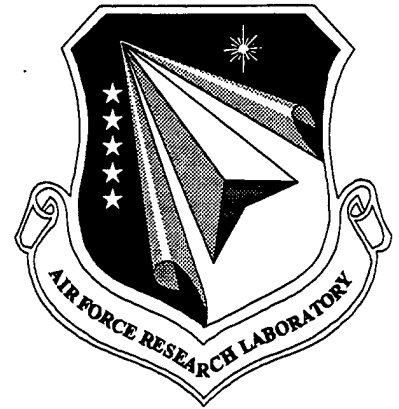


AFRL-PR-WP-TR-1998-2102

**COMBUSTION AND HEAT
TRANSFER
VOLUME 4: COMBUSTION DATA SETS**



**D. R. Ballal
W. J. Schmoll
R. Streibich**

**F. Takahashi
M. D. Vangsness**

**University of Dayton Research Institute
300 College Park
Dayton OH 45469-0110**

DECEMBER 1997

FINAL REPORT FOR PERIOD 6/8/92 – 12/31/97

19990128 030

Approved for public release; distribution unlimited


**PROPULSION DIRECTORATE
AIR FORCE RESEARCH LABORATORY
AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433-7251**

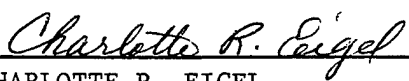
NOTICE

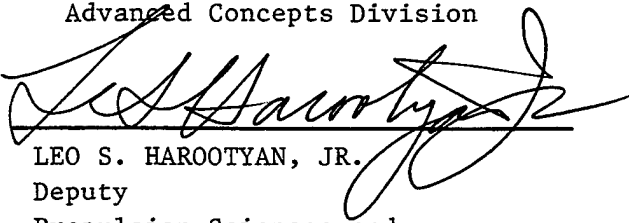
USING GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA INCLUDED IN THIS DOCUMENT FOR ANY PURPOSE OTHER THAN GOVERNMENT PROCUREMENT DOES NOT IN ANY WAY OBLIGATE THE US GOVERNMENT. THE FACT THAT THE GOVERNMENT FORMULATED OR SUPPLIED THE DRAWINGS, SPECIFICATIONS, OR OTHER DATA DOES NOT LICENSE THE HOLDER OR ANY OTHER PERSON OR CORPORATION; OR CONVEY ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY RELATE TO THEM.

THIS REPORT IS RELEASABLE TO THE NATIONAL TECHNICAL INFORMATION SERVICE (NTIS). AT NTIS, IT WILL BE AVAILABLE TO THE GENERAL PUBLIC, INCLUDING FOREIGN NATIONS.

THIS TECHNICAL REPORT HAS BEEN REVIEWED AND IS APPROVED FOR PUBLICATION.


CHARLES W. FRAYNE
Combustion Branch
Propulsion Sciences and
Advanced Concepts Division


CHARLOTTE R. EIGEL
Chief, Combustion Branch
Propulsion Sciences and
Advanced Concepts Division


LEO S. HAROOTYAN, JR.
Deputy
Propulsion Sciences and
Advanced Concepts Division

Do not return copies of this report unless contractual obligations or notice on a specific document requires its return.

REPORT DOCUMENTATION PAGEForm Approved OMB
No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 1997	3. REPORT TYPE AND DATES COVERED Final 6/8/92 - 12/31/97	
4. TITLE AND SUBTITLE COMBUSTION AND HEAT TRANSFER: Volume 4: COMBUSTION DATA SETS			5. FUNDING NUMBERS C-F33615-92-C-2207 PE: 62203 PR: 3048 TA: 05 WU: AH	
6. AUTHOR(S) D. R. Ballal, F. Takahashi, W. J. Schmoll, M. D. Vangsness, and R. Striebich				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of Dayton Research Institute 300 College Park Dayton, OH 45469-0110 50280			8. PERFORMING ORGANIZATION REPORT NUMBER UDR-TR-1998-00103	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Propulsion Directorate Air Force Research Laboratory Air Force Materiel Command Wright-Patterson Air Force Base OH 45433-7251 POC: Charles W. Frayne, AFRL/PRSC, 937-255-6250			10. SPONSORING/MONITORING AGENCY REPORT NUMBER AFRL-PR-WP-TR-1998- 2102	
11. SUPPLEMENTARY NOTES				
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The objective of the proposed research was to develop a fundamental understanding of the combustion process in a gas turbine combustor. Specifically, we performed WSR experiments, vortex-flame interaction studies, flame stabilization research, and studies of turbine blade film cooling. In this report, we present the Combustion Data Sets that may be used by modelers in the industry and elsewhere for evaluating and refining computer models. More exhaustive information is available in the individual papers and reports listed here. All data sets were prepared using Microsoft Office 97 for IBM PC-compatible computers and are available on computer diskettes.				
14. SUBJECT TERMS Combustor Design, Flame Stabilization, Lean Blowout, Swirling Flames, Turbulent Combustion, Turbine Blade Cooling			15. NUMBER OF PAGES 105	
			16. PRICE CODE NSP	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT SAR	

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
PREFACE	vi
1.0 INTRODUCTION.....	1
2.0 DESCRIPTION OF FACILITY & TEST CONDITIONS	
2.1 Well Stirred Reactor (WSR) Experiments	2
2.1.1 Test Facility and Instrumentation.....	2
2.1.2 Test Conditions.....	2
2.1.3 Error Analysis.....	2
2.2 Step Swirl Combustor (SSC) Experiments	3
2.2.1 Test Facility and Instrumentation.....	3
2.2.2 Test Conditions.....	4
2.2.3 Error Analysis.....	4
2.3 Turbulent Swirling Flame Experiments.....	5
2.3.1 Test Facility and Instrumentation.....	5
2.3.2 Test Conditions.....	5
2.3.3 Error Analysis.....	6
3.0 LIST OF RELEVANT PUBLICATIONS	9
APPENDIX--SELECTED DATA SETS	
A Well Stirred Reactor (WSR) Studies	15
B Step Swirl Combustor Studies	44
C Turbulent Swirling Flame Studies.....	68

FIGURES

Figure 1. Schematic of the Toroidal WSR (all dimensions in mm)	12
Figure 2. WSR Test Facility and Associated Instrumentation	13
Figure 3. Schematic of a Step Swirl Combustor	14
Figure 4. Schematic of a Swirling Jet Diffusion Flame Combustor.....	14

TABLES

Table 1. Well Stirred Reactor (WSR) Test Matrix.....	7
Table 2. Step Swirl Combustor (SSC) Test Conditions	7
Table 3. Experimental Test Conditions for Turbulent Swirling Jet Diffusion Flames	8

PREFACE

The University of Dayton Research Institute (UDRI), working under Air Force Contract No. F33615-92-C-2207 submitted this final report to the U.S. Air Force Wright Laboratory, Aero Propulsion and Power Directorate, Wright-Patterson AFB, OH. Mr. Charles Frayne of WL/POSC (now AFRL/PRSC) was the Contract Monitor and Dr. D. R. Ballal of the Aerospace Mechanics Division, UDRI was the Principal Investigator. This report covers work performed during the period June 8, 1992 through December 31, 1997.

The Principal Investigator wishes to express his gratitude and appreciation to Dr. W. M. Roquemore for his encouragement and support and to Ms. Linda Nianouris for her assistance in report preparation.

1.0 INTRODUCTION

A long-term goal of the Air Force is to develop high-performance gas turbine engines with combustors that operate at near-stoichiometric conditions, burn broad-specification fuels, and have low maintenance and high durability. Therefore, the objective of the proposed research was to develop a fundamental understanding of the combustion process in a gas turbine combustor by designing a variety of laboratory experiments. Specifically, we completed the following key investigations.

1. WSR experiments to study combustion stability, lean blowout (LBO), and emissions.
2. Flame stabilization and lean blowout studies using a step swirl combustor (SSC).
3. Study of turbulent swirling jet diffusion flame structure and stability.

In this final report, we present the Combustion Data Sets that may be used by modelers in the industry and other laboratories for evaluating and refining computer models of gas turbine combustor. Only a sample of these data sets is presented. An exhaustive amount of information is available in the individual papers and data set reports listed in the next section. All the data sets were prepared using Microsoft Office 97 Software for IBM PC-Compatible computers. These data sets are also available on computer floppy diskettes, CDs, and by accessing the World Wide Web (WWW).

These data sets were obtained in the Fundamental Combustion Laboratory located in Building 490, Test Cells 151,152, and 153 of the Fuels and Lubrication Division (WL/POSF). This test facility is equipped with a toroidal well stirred reactor (WSR), an SSC, and a swirling jet diffusion flame combustor. A brief description of the test facility and test conditions is given. Next, selected (and sample) data sets are presented on WSR experiments, SSC tests, and turbulent swirling flame measurements. An analysis, discussion, and interpretation of these data and results are presented in a separate "combustion studies" report.

2.0 DESCRIPTION OF TEST FACILITY

2.1 Well Stirred Reactor (WSR) Experiments

2.1.1 Test Facility and Instrumentation

Figure 1 shows a 250-ml toroidal WSR that was used for this experiment. This reactor was constructed of alumina cement, and featured a jet ring with 32 stainless steel jets, 1 mm I.D., to inject the fuel-air mixture at high subsonic velocity ($Ma = 0.42$ to 0.85). Figure 2 provides a schematic of the test facility and instrumentation.

The Horiba Emissions Analyzers comprised the following units: Model MPA-510 oxygen analyzer (0 to 50 volume percent), Model FIA-510 total hydrocarbon analyzer (0 to 10,000 ppm carbon), Model VIA-510 CO (0 to 20 volume percent) and CO₂ (0 to 100 volume percent) analyzer, and Model CLA-510 SS NO and NO_x analyzer (0 to 2000 ppmV). These units were calibrated with gases of the following concentrations: hydrocarbon = 404 ppmV propane, NO = 92 ppmV, NO₂ = 1.6 ppmV, CO = 0.4 volume percent, O₂ = 4.03 or 5.02 volume percent and CO₂ = 11.06 volume percent. Water was scrubbed from the sample gas to a maximum dew point of 5C. All emissions are quoted on dry standard air basis.

A gas sample was drawn from the WSR by a water-cooled stainless steel probe. Hydrocarbon speciation at LBO conditions was performed by collecting sample gas in a Tedlar bag and directly injecting sample into a gas chromatograph-flame ionization detector (GC-FID, Hewlett-Packard HP 5890 A). Combustion temperature, T_f , was measured by insertion of a Type B thermocouple (platinum-6% rhodium, platinum-30% rhodium) coated with alumina ceramic. Temperature measurements were corrected for heat loss by conduction and radiation to colder reactor walls, and heat gain by convection and catalysis. A vaporizer was built to prevaporize liquid fuels, mix the vaporized fuel with air, and then supply this combustible mixture to the WSR.

2.1.2 Test Conditions

Our test matrix is shown in Table 1. The WSR operated over the range of equivalence ratios $\phi = 0.43$ to 0.88 , loading parameter (LP) ~ 1.3 g-mol/sec·L·atm^{1.75}, residence times $\tau \sim 5$ to 8 msec and reactor temperatures $T_f = 1350$ to 2000 K. Hydrocarbons tested were: methane, ethane, cyclohexane, n-heptane, n-dodecane, toluene, ethylbenzene and a gaseous mix of 15 percent methane, 25 percent ethane, 60 percent ethylene by volume (a cracked fuel simulant).

Emissions measurements were performed for all test conditions shown. A volumetric mix of 13 percent CH₄, 22 percent C₂H₆, 52 percent C₂H₄, 13 percent C₇H₈ by volume, giving a carbon number, CN = 2.52 and carbon to hydrogen mole ratio, (C/H) = 0.5081 was selected as simulant for heavy, aromatic-containing fuels that are cracked using thermal or catalytic processes into light fractions with residual light aromatics. Additionally, several of the leanest conditions shown represented LBO, at which point bag sample emissions data were collected.

2.1.3 Error Analysis

Gaseous fuel flow was monitored to within ± 2 percent of reading using a Gilmont rotameter. Airflow was monitored to within ± 2 percent of full scale using a Brooks rotameter. The combined error produced an uncertainty of ± 3.5 percent in ϕ during combustion of methane in air. Nozzle air was monitored to within ± 2 percent of full scale using a Gilmont rotameter. Liquid hydrocarbons were controlled to within ± 0.3 g/min by the liquid fuel delivery system. The

combined error produced an uncertainty of ± 3.5 percent in ϕ during combustion of a liquid fuel in air. The T_f measurements using the calorimetric method were repeatable at a given ϕ from day-to-day within ± 30 K. Also, calibrated thermocouples agreed with the measurements using the calorimetric method within ± 30 K. The Horiba emissions analyzers have an accuracy within one percent of full scale. This represented an error of 2 ppmV NO_x , 50 ppmV CO, 10 ppmV carbon for UHC, 0.25 volume percent O_2 , and 0.5 volume percent CO_2 . Residence time was typically controllable to within ± 0.6 msec. Additionally, CO measurements were repeatable from day to day within ± 100 ppmV, and NO_x within ± 1.5 ppmV. UHC measurements at very lean conditions suffered from poor repeatability due to variance in the LBO condition. This issue is discussed in detail later. Finally, the sampling system was capable of measuring approximately 90 percent of the CO concentration simulated to be the WSR product concentration at $\phi = 0.6$, $\tau = 7.0$ msec. This suggests that probe oxidation reactions are minimized by the water-cooled stainless steel probe design.

2.2 Step Swirl Combustor (SSC) Experiments

2.2.1 Test Facility and Instrumentation

Figure 3 shows a schematic diagram of SSC, which has a 150-x150-mm cross section, length of 754 mm, and a step height of 55 mm. Fuel is supplied to the combustor by the annular fuel tube (20 mm i.d. and 29 mm o.d.) coaxially sandwiched between swirling air streams; the inner air jet (20 mm dia.) and the outer annular air jet (29 mm i.d. and 40 mm o.d.). The combustor exit has a 45% blockage orifice plate on top that simulates the back pressure exerted by the dilution jets in a practical gas turbine combustor. The SSC has quartz windows on all four sides to permit visual observations and laser diagnostics measurements. Stationary helical vane swirlers were located 25 mm upstream from the burner tube exit in each of the air passages. The inner swirler had six vanes with a central 1.4 mm dia. hole to prevent the flame from anchoring to the swirler. The outer swirler had 12 vanes. Inner swirler lengths are 25, 19, and 19 mm, respectively, for 30°, 45°, and 60° swirlers; outer swirler lengths are 32, 25, and 19 mm, respectively, for 30°, 45°, and 60° swirlers. We used flow visualization, CARS system for temperature measurements, and the LDA system for velocity measurements. The CARS and LDA systems are described below.

CARS System: A Coherent Anti-Stokes Raman Spectroscopy (CARS) optics system was used for unintrusive flame temperature measurements. Briefly, the CARS signal was generated by combining two 30 mJ doubled Nd:Yag beams at 532nm and one 25 mJ broad band dye laser beam centered at 607nm and pumped by the same Nd:Yag laser. The pulse laser and detector camera run at 10 Hz. A Boxcars configuration with an ellipsoidal probe volume approximately 25 μm (dia.) x 250 μm (length) was used for collecting the signal. The detector is a Princeton Instruments intensified 576x384 charge coupled device (CCD). The intensifier is triggered by a Princeton PG-10 pulsar. A Princeton ST-130 controller operates the camera and the detector chiller. The collection process is controlled by Princeton's ST-130 CSMA software package running on a personal computer. Spectra are fit to a library of spectra by a nonlinear fitting routine running on a personal computer. A total of 250 samples was taken for each CARS temperature measurement.

LDA System: Unintrusive velocity measurements were made using a Dantec Fiber-Flow LDA system. Essentially, the 2-D LDA system uses the 514nm and 488nm lines from an Argon-ion laser. The laser output is directed into a Dantec Fiber flow transmitter where the colors are

separated and directed to optical fiber couplers by a Bragg cell operating at 40 MHz. The four beams are guided to the probe via polarization preserving fibers. The recollimated and focused laser beams cross to produce an ellipsoidal probe volume approximately 100 μ m (dia.) x 1000 μ m (length). A fluidized-bed seeder was used to inject submicron-sized (97% < 1 μ m) ZrO₂ particles into each burner tube passage. Velocity biasing was resolved by seeding one passage at a time. The forward scattered signal is collected and separated by diachronic mirrors before it is detected by photo multiplier tubes and processed by individual TSI burst counters. Typical coincident sampling rates exceeded 1 kHz in flames. A total of 2048 coincident samples were collected for each velocity measurement. Custom-designed software was used to reduce the data on a personal computer. Three-component noncoincident velocity measurements were made with the 2D LDA system by scanning in the transverse and radial directions to get axial and tangential velocities, and axial and radial velocities, respectively.

2.2.2 Test Conditions

Table 2 lists the experimental test conditions for the SSC. Since increasing the inner vane angle increases turbulent mixing and strengthens the inner recirculation zone; these changes dramatically affect the flame structure and the stability characteristics. Therefore, experiments were performed to reveal the differences in flame structure by changing the inner vane angle. Test conditions were also chosen to compare: (i) attached versus lifted flames and (ii) co versus counterswirl configurations.

Experimental measurements included flame photography, three-component mean and rms velocities, mean and rms temperatures, and LBO. The LBO data were collected by maintaining a constant airflow rate, heating the combustor to a near steady-state temperature at stoichiometric fuel-air ratio, and then gradually decreasing the fuel flow rate until blowout occurred.

2.2.3 Error Analysis

For obtaining flame temperature, usually, 500 samples were taken for each CARS measurement to ensure that the error in the rms temperature was less than 10 K, while 1500 samples were taken in the flame region where the rms values were expected to be large. Overall, we estimated the CARS mean temperature measurement accuracy to be within 50 K, while the precision was well within 20 K. Unlike the LDA, CARS temperature measurements are time-averaged, without the density biasing effects. We also discovered that once system parameters are optimized and the dye laser is tuned, the CARS system can run for long periods of time. For example, we obtained repeatability to within ± 20 K for a mean flame temperature of 1500 K after 4 days of operation.

In processing the LDA Doppler burst signal to obtain velocity measurements, typically a total of 2⁵ cycles/burst are requested and the spurious data are filtered by using the 3s test. The error in rms velocity was less than 3 percent and uncertainty in mean velocity was less than 1 percent at a 95 percent confidence limit. However, in recirculatory and reactive flows, the velocity statistical biasing was worst. We found that the mean values can be overestimated up to 7 percent and the rms values underestimated up to 5 percent for turbulence intensity levels above 20 percent. The flow rates calculated from integrating the velocity profiles were 3 percent or less than the measured flow rates. This difference is partly attributed to the plus-or-minus 1 percent measurement accuracy of the mass flow controller. To eliminate velocity biasing due to non-uniform seeding, a conditional data sampling technique was used by seeding particles into only the

fuel jet or the annular coflowing air. This type of technique allowed us to track the convection and diffusion of one (seeded) fluid into another (unseeded) fluid.

2.3 Turbulent Swirling Flame Experiments

2.3.1 Test Facility and Instrumentation

Figure 4 shows the schematic of a turbulent swirling jet diffusion flame combustor. This combustor consists of a central fuel tube (9.45-mm inner diameter, 0.2-mm lip thickness, 806-mm length) and a concentric annular-air tube (26.92-mm inner diameter), centered in a vertical test section (150 x 150-mm square cross section with rounded corners, 486-mm length), through which external air is supplied. The test section has four quartz windows for laser diagnostic measurements. A helical vane swirler unit is placed in the annulus channel 96 mm upstream from the jet exit. We used flow visualization, CARS system for temperature measurements and LDA system for velocity measurements. The CARS and LDA systems are described below.

CARS System: The CARS optics layout was used for temperature measurements. The laser source is provided by a Nd:Yag pulse laser with a 10-ns time resolution and a Boxcars configuration is used. The probe volume is approximately 25- μm by 250- μm . The CARS signal is collected by a Spex 1702 spectrometer, 2-D charge coupled diode (CCD) camera from Princeton instruments, and Tracor-Northern multi channel analyzer. A total of 250 samples were taken for each CARS temperature measurements. The raw data is processed by in-house software on a personal computer.

LDA System: A custom-made three-component LDA system was used for velocity measurements. This is a three-beam two component (axial and radial) set using a 514.5 nm line of an 18 W argon-ion laser with a component separation based on polarization. A two-beam third component (tangential) set uses a 488.0 nm line with separation by color. Since the third component is normal to the first and second components, the measurement volume had a quasi-spherical shape of 100 μm diameter and the calculated fringe spacing was 3.6 μm . The LDA system has Bragg cell frequency shifting (10 MHz for the first and second channels and 30 MHz for the third channel) for measurements in recirculatory flows, 4- σ filtering software for spurious signals, for example, due to seed agglomeration, and a correction subroutine to account for the LDA signal biasing effects in combustor flows. A fluidized-bed seeder was used to inject sub micron-sized (0.1 μm) ZrO_2 particles into each passage. Counter type (TSI 1990C) signal processors and tailor-made coincidence circuit ensured valid data rate acquisition. All the LDA signals were processed using our custom-designed software which calculates intensity, shear stresses, higher moments (skewness and kurtosis), and pdfs. Typical LDA sampling rates exceeded 1 kHz for both isothermal and combustor flow measurements.

2.3.2 Test Conditions

Table 3 shows the test conditions employed using gaseous hydrogen as the fuel. All tests were performed at room temperature and atmospheric pressure. The fuel jet, air jet, and the external coflowing stream velocities were up to 30 m/s, 10 m/s, and 0.5 m/s, respectively. The flame stability limits were measured as follows. For a fixed annular- and coflowing-airflow rates, the fuel flow rate was increased gradually until the flame attached to the burner-rim, lifted above the burner, or simply extinguished (blowoff). Now, at the lift condition, fuel flow was: (1) decreased

until the flame reattached to the burner-rim (dropback), or (2) increased until the lifted flame extinguished (blowout). A three-component LDA, CARS, and Mie scattering systems were used for a variety of conditioned and unconditioned measurements of mean and turbulent quantities. For a set of values of jet, annulus, and external velocity, measurements extending up to 34 jet diameters were made at a large number of radial locations up to $\times 3.2$ jet diameters.

2.3.3 Error Analysis

LDA Precision and Accuracy: In processing the LDA Doppler burst signal, typically a total of 2^5 cycles/burst are requested and the spurious data are filtered by using the 3s test. The error in rms velocity was less than 3 percent and uncertainty in mean velocity was less than 1 percent at a 95 percent confidence limit. However, in recirculatory and reactive flows, the velocity statistical biasing was worst. We found that the mean values can be overestimated up to 7 percent and the rms values underestimated up to 5 percent for turbulence intensity levels above 20 percent. The flow rates calculated from integrating the velocity profiles were 3 percent or less than the measured flow rates. This difference is partly attributed to the plus-or-minus 1 percent measurement accuracy of the mass flow controller. To eliminate velocity biasing due to non-uniform seeding, a conditional data sampling technique was used by seeding particles into only the fuel jet or the annular coflowing air. This type of technique allowed us to track the convection and diffusion of one (seeded) fluid into another (unseeded) fluid.

CARS Precision and Accuracy: Usually, 500 samples were taken for each CARS measurement to ensure that the error in the rms temperature was less than 10 K, while 1500 samples were taken in the flame region where the rms values were expected to be large. Overall, we estimated the CARS mean temperature measurement accuracy to be within 50 K, while the precision was well within 20 K. Unlike the LDA, CARS temperature measurements are time-averaged, without density biasing effects. We also discovered that once system parameters are optimized and the dye laser is tuned, the CARS system can run for long periods of time. For example, we obtained repeatability to within $\times 20$ K for a mean flame temperature of 1500 K after four days of operation.

Table 1: Well Stirred Reactor (WSR) Test Matrix.

Hydrocarbon	Carbon Number	(C/H)	τ (msec)	ϕ_{\min}	ϕ_{\max}	$T_{f \min}$ (K)	$T_{f \max}$ (K)
Methane	1	0.25	7.3	0.55	0.88	1507	1967
			6.32	0.59	0.83	1517	1918
Ethane	2	0.333	7.26	0.48	0.84	1407	1996
Cyclohexane	6	0.5	7.47	0.48	0.82	1429	1981
			5.22	0.51	0.78	1536	1922
n-Heptane	7	0.4375	7.19	0.53	0.84	1517	1975
			5.49	0.54	0.81	1595	1974
Toluene	7	0.875	7.32	0.46	0.79	1499	1946
			5.35	0.5	0.78	1552	1936
Ethylbenzene	8	0.8	7.43	0.48	0.76	1478	1958
			5.33	0.49	0.67	1546	1839
Cracked Fuel Simulant	2.52	0.5081	6.75	0.49	0.77	1530	2007
			5.17	0.46	0.76	1391	1969
n-Dodecane	12	0.4615	7.39	0.46	0.8	1357	1979
			5.2	0.55	0.79	1581	1983

Table 2: Step Swirl Combustor (SSC) Test Conditions.

Variable	Range
Inner vane angle (deg.)	0, 30 and 45
Outer vane angle (deg.)	30
Vane configuration	Co- and counter-swirl
Inner air velocity (m/s)	14.4
Re	18,000
Outer air velocity (m/s)	8.6
Re	14,800
Fuel velocity (m/s)	2.5
Re	3,200
Equivalence ratio	0.9
Fuel	Methane

Table 3: Experimental Test Conditions for Turbulent Swirling Jet Diffusion Flames.

Case	θ (deg.)	U_j (m/s)	U_a (m/s)	U_c (m/s)
1	0	25	4	1
2	0	100	20	4
3	30	100	20	4
4	45	100	20	4

3.0 LIST OF RELEVANT PUBLICATIONS

Journal Publications

1. F. Takahashi and M. D. Vangsness, "Near-Field CARS Measurements and the Local Extinction of Turbulent Jet Diffusion Flames," *Dynamics of Heterogeneous Combustion and Reacting Systems*, AIAA Progress in Astronautics and Aeronautics Series, Vol. 152, pp. 37-55, 1993.
2. D. R. Ballal, M. D. Vangsness, S. P. Heneghan, and G. J. Sturgess, "Studies of Lean Blowout in a Research Combustor," *NATO Advisory Group on Aerodynamics Research and Development*, AGARD-CP-536, Paper Number 18, 1993.
3. M. D. Durbin and D. R. Ballal, "Studies of Lean Blowout in a Step Swirl Combustor," *Transactions of ASME, Journal of Gas Turbine and Power*, Vol. 118, pp. 72-78, Jan. 1996.
4. J. Zelina and D. R. Ballal, "Combustion Studies in a Well Stirred Reactor," *AIAA Journal of Propulsion and Power*, Vol. 10, pp. 132-139, 1994.
5. F. Takahashi, W. J. Schmoll, and J. L. Dressler, "Characteristics of a Velocity-Modulated Pressure-Swirl Atomizing Spray Measured by the Phase-Doppler Method," *AIAA Journal of Propulsion and Power*, Vol. 11, pp. 955-963, 1995.
6. F. Takahashi, W. J. Schmoll, G. L. Switzer, and D. T. Shouse, "Structure of a Spray Flame Stabilized on a Production Engine Combustor Swirl Cup," *Proceedings of 25th Symposium (Int.) on Combustion*, The Combustion Institute, pp. 183-191, 1994.
7. F. Takahashi, W. J. Schmoll, and J. L. Dressler, "Characterization of a Velocity-Modulation Atomizer," *Reviews of Scientific Instruments*, Vol. 65, pp. 3563-68, 1994.
8. F. Takahashi, "Sooting Correlations for Premixed Combustion," *Physical & Chemical Aspects of Combustion: A Tribute to Irvin Glassman* (Eds. R. F. Sawyer and F. L. Dryer) Gordon & Breach, New York, NY, 1996.
9. F. Takahashi and V. R. Katta, "Numerical Experiments on the Vortex-Flame Interactions in a Jet Diffusion Flame," *AIAA Journal of Propulsion and Power*, Vol. 11, pp. 170-176, 1995.
10. S. Zabarnick and J. Zelina, "Chemical Kinetics of NO_x Production in a Well Stirred Reactor," AIAA Paper No. 94-3828, *Proceedings of 29th Intersociety Energy Conversion Engineering Conference*, pp. 649-653, AIAA, Washington D.C., 1994.
11. M. D. Durbin and D. R. Ballal, "Optimizing the Combustion Performance of a Step Swirl Combustor," AIAA Paper No. 94-3825, *Proceedings of 29th Intersociety Energy Conversion Engineering Conference*, pp. 631-635, AIAA, Washington D.C., 1994.

12. J. Zelina, R. C. Striebich, and D. R. Ballal, "Pollutant Emissions Research Using a Well Stirred Reactor," AIAA Paper No. 94-3827, in *Proceedings of 29th Intersociety Energy Conversion Engineering Conference*, pp. 644-648, AIAA, Washington D.C., 1994.
13. M. D. Durbin and D. R. Ballal, "Studies of Combustion and Emissions in a Model Step Swirl Combustor," *Proceedings of the FACT Vol. 18*, pp. 17-21, ASME (Int.) Joint Power Generation Conference, New York, NY, 1994.
14. J. Zelina and D. R. Ballal, "Studies of Pollutant Emissions in a Well Stirred Reactor," *Proceedings of the FACT Vol. 18*, pp. 12-16, ASME (Int.) Joint Power Generation Conference, New York, NY, 1994.
15. F. Takahashi, M. D. Vangsness, and M. D. Durbin, "Stabilization of Hydrogen-Jet Diffusion Flames With and Without Swirl," *Transport Phenomenon In Combustion*, (S. H. Chan, Ed.) Vol. 1, pp. 593-604, Taylor & Francis, Washington D.C., 1996.
16. F. Takahashi, W. J. Schmoll, D. D. Trump, and L. P. Goss, "Vortex-Flame Interactions and Extinction of Turbulent Jet Diffusion Flames," *Proceedings of the 26th Symposium (Int.) on Combustion, The Combustion Institute*, pp. 145-152, 1996.
17. F. Takahashi and V. R. Katta, "Unsteady Extinction Mechanisms of Jet Diffusion Flames," To appear in *Proceedings of the 26th Symposium (Int.) on Combustion, The Combustion Institute*, pp. 1151-1160, 1996.
18. F. Takahashi, M. S. Anand, M. D. Vangsness, M. D. Durbin, and W. J. Schmoll, "An Experimental and Computational Study of Swirling Hydrogen Jet Diffusion Flames," *Transactions of ASME, Journal of Engineering for Gas Turbines and Power*, Vol. 119, pp. 305-314, 1997.
19. M. D. Durbin, M. D. Vangsness, D. R. Ballal, and V. R. Katta, "Study of Flame Stability in a Model Step Combustor," *Transactions of ASME, Journal of Engineering for Gas Turbines and Power*, Vol. 118, pp. 308-315, 1996.
20. J. Zelina and D. R. Ballal, "Combustor Stability and Emissions Research Using a Well Stirred Reactor," ASME Paper No. 95-GT-109, to appear in *Transactions of ASME, Journal of Engineering for Gas Turbines and Power*, June 1996.
21. F. Takahashi, M. D. Vangsness, M. D. Durbin, and W. J. Schmoll, "Structure of Turbulent Hydrogen Jet Diffusion Flames with and without Swirl," *Transactions of ASME, Journal of Heat Transfer*, Vol. 118, pp. 877-884, 1996.
22. J. Zelina, J. Blust, and D. R. Ballal, "Combustion of Liquid Fuels in a Well Stirred Reactor," ASME Paper No. 96-GT-047, Presented at ASME Turbo Expo. '96, Birmingham, U.K., June 1996.

23. J. Zelina and D. R. Ballal, "Emissions Studies in a Well Stirred Reactor and Applications to Combustion Modeling," *Proceedings of FACT, Vol. 21, ASME (Int.) Joint Power Generation Conference*, pp. 255-263, October 1996.
24. G. J. Sturgess, A. L. Lesmerises, S. P. Heneghan, M. D. Vangsness, and D. R. Ballal, "Lean Blowout in a Research Combustor at Simulated Low Pressures," *Transactions of ASME, J. of Engineering for Gas Turbines and Power*, Vol. 118, pp. 773-781, 1996.
25. F. Takahashi and V. R. Katta, "A Numerical Study of a Methane Diffusion Flame over a Flat Surface," To appear in *Proceedings of the Second International Symposium on Scale Modeling*, June 1997.

UDRI Reports

1. F. Takahashi, M. D. Vangsness, and M. D. Durbin, "LDV Measurements in Swirling and Non-Swirling Coaxial Turbulent Air Jets--No. 5: 45 degree swirler, 100 m/s," University of Dayton Technical Report, UDR TR 93-22, May 1993.
2. F. Takahashi, M. D. Vangsness, and M. D. Durbin, "LDV Measurements in Swirling and Non-Swirling Coaxial Turbulent Air Jets--No. 6: 45 degree swirler, 25 m/s," University of Dayton Technical Report, UDR TR 93-23, June 1993.
3. F. Takahashi, M. D. Vangsness, and M. D. Durbin, "LDV Measurements in Swirling and Non-Swirling Coaxial Turbulent Air Jets--No. 7: 60 degree swirler, 25 m/s," University of Dayton Technical Report, UDR TR 93-24, July 1993.
4. F. Takahashi, M. D. Durbin, and M. D. Vangsness, "LDV Measurements in Swirling and Non-Swirling Coaxial Turbulent Hydrogen Jet Diffusion Flames--No. 1: No Swirl, 25 m/s," University of Dayton Technical Report, UDR TR 93-88, September 1993.
5. F. Takahashi, M. D. Durbin, W. J. Schmoll, and M. D. Vangsness, "LDV Measurements in Swirling and non-Swirling Coaxial Turbulent Hydrogen Jet Diffusion Flames--No. 2: No Swirl, 100 m/s," University of Dayton Technical Report, UDR TR 94-115, July 1994.
6. F. Takahashi, M. D. Durbin, W. J. Schmoll, and M. D. Vangsness, "LDV Measurements in Swirling and non-Swirling Coaxial Turbulent Hydrogen Jet Diffusion Flames--No. 3: 30-degree Swirl, 100 m/s," University of Dayton Technical Report, UDR TR 94-116, August 1994.
7. F. Takahashi, M. D. Durbin, W. J. Schmoll, and M. D. Vangsness, "LDV Measurements in Swirling and non-Swirling Coaxial Turbulent Hydrogen Jet Diffusion Flames--No. 4: 45-degree Swirl, 100 m/s," University of Dayton Technical Report, UDR TR 94-117, September 1994.

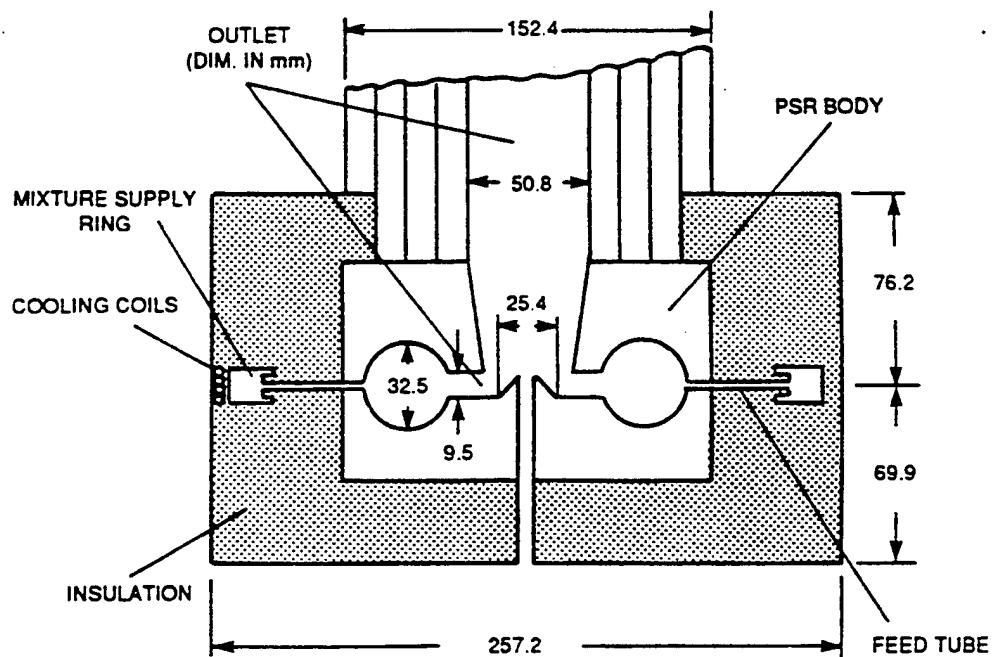


Fig. 1: Schematic diagram of a toroidal WSR (dimensions in mms)

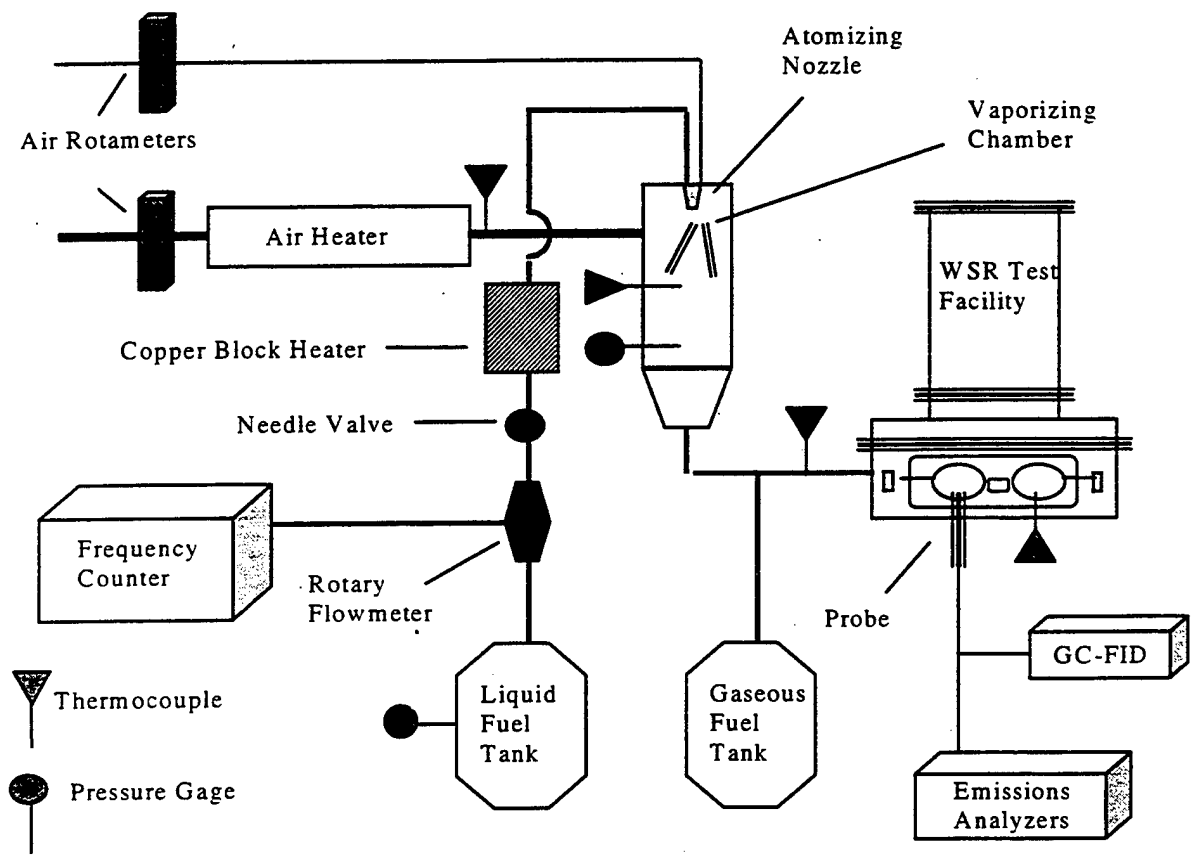


Fig. 2: WSR test facility and associated instrumentation.

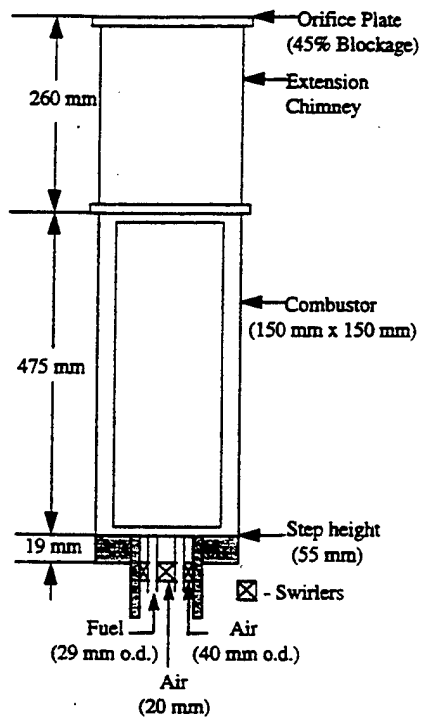


Fig. 3. Schematic of a Step Swirl Combustor.

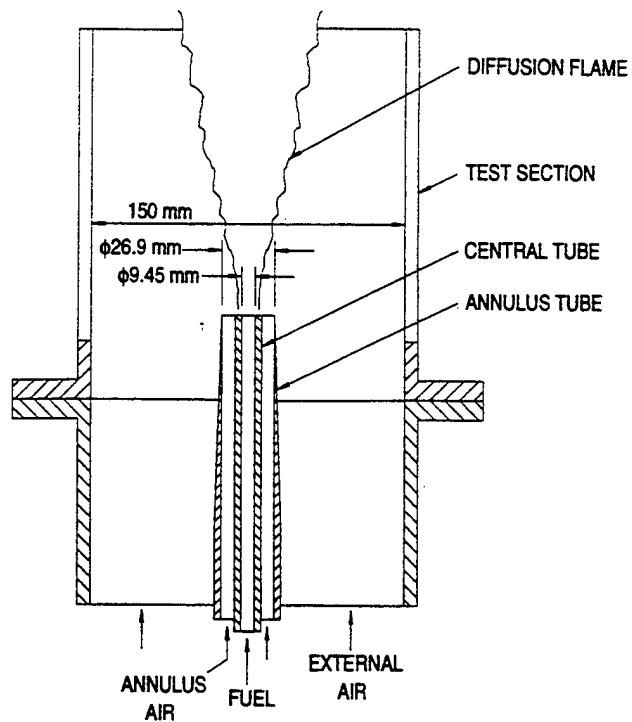


Fig. 4. Schematic of a swirling jet diffusion flame combustor

APPENDIX A
WELL STIRRED REACTOR (WSR)
(SELECTED DATA SET)

Table 1

[illegible]

Table 1 cont.

n-Heptane Data										From calorimetric	
El NOx	Q CO (slpm)	m CO (g/s)	El CO	Q THC (slpm)	m THC (g/s)	El THC	η	AFT	Tf (K)		
0.05	1.059430055	0.020482314	71.77	0.006419935	7.11436E-05	0.25	0.983600757	1590	1570		
0.09	0.922163828	0.017828501	62.09	0.003556413	3.9411E-05	0.14	0.985891477	1618	1600		
0.11	0.766666559	0.01482222	51.14	0.001942141	2.15222E-05	0.07	0.988418412	1658	1643		
0.08	0.67427854	0.013036052	44.48	0.001457492	1.61514E-05	0.06	0.989935935	1693	1680		
0.17	0.626955919	0.012121148	41.16	0.000940867	1.04264E-05	0.04	0.990702836	1714	1701		
0.18	0.608062694	0.011755879	39.79	0.000744042	8.24523E-06	0.03	0.991018443	1733	1720		
0.18	0.591844621	0.011442329	38.35	0.000669736	7.42179E-06	0.02	0.991345356	1757	1744		
0.21	0.573612066	0.011089833	37.29	0.000548287	6.07593E-06	0.02	0.991588108	1789	1777		
0.25	0.579002354	0.011194046	37.58	0.000417685	4.62865E-06	0.02	0.991528038	1811	1798		
0.31	0.590004965	0.011406763	38.23	0.000336144	3.72504E-06	0.01	0.99138457	1827	1814		
0.35	0.640894491	0.012390627	40.98	0.000296169	3.28204E-06	0.01	0.990767944	1879	1865		
0.45	0.738219998	0.014272253	45.75	0.000252901	2.80257E-06	0.01	0.989694875	1918	1902		
0.52	0.759012258	0.014674237	47.13	0.000166691	1.84721E-06	0.01	0.989389172	1935	1918		
0.61	0.838610228	0.016213131	51.79	0.000129309	1.43296E-06	0.00	0.988340638	1966	1947		
0.77	0.926864394	0.017919378	56.73	0.000128582	1.4249E-06	0.00	0.987229353	2002	1981		
0.92	1.000747963	0.019347794	61.14	9.68792E-05	1.07358E-06	0.00	0.986237794	2025	2002		
1.12	1.11776253	0.021610076	68.17	5.14127E-05	5.69738E-07	0.00	0.984658515	2054	2028		
1.26	1.215337339	0.023496522	73.71	2.98897E-05	3.31228E-07	0.00	0.983411422	2098	2069		
1.46	1.337551537	0.02585933	79.78	3.65914E-05	4.05494E-07	0.00	0.982046378	2121	2089		
1.70	1.437255479	0.027786939	85.56	1.44672E-05	1.60321E-07	0.00	0.980745331	2148	2113		
1.87	1.45230253	0.028077849	86.62	1.37137E-07	1.51971E-09	0.00	0.980507457	2155	2119		

Table 1 cont.

[illegible]

Table 2

Methane Data																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
--------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 3

[illegible]

Table 3 cont

[illegible]

Table 4

[illegible]

Table 4 cont

[illegible]

[illegible]

Table 5 cont

[illegible]

Table 6

[illegible]

Table 7

[illegible]

Table 8

[illegible]

Table 8 cont

[illegible]

Table 9

Endothermic Simulant data									
Phi	A	M	R	B	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)	CO2 (vol %)
0.49	25381.09013	29.17075741	285.0252	3651.49346	6.95	20.72	1.92	1392.68	7.01
0.51	25374.33618	29.16894971	285.0428	3675.94377	6.90	18.70	2.21	1237.11	7.20
0.53	25368.12582	29.16683779	285.0635	3748.496897	6.77	17.10	3.47	1084.26	7.60
0.56	25356.29172	29.17907602	284.9439	3773.574634	6.72	18.28	5.68	1087.45	8.04
0.57	25346.66643	29.17746377	284.9597	3735.191425	6.79	18.87	6.74	1043.40	8.16
0.59	25340.28372	29.18099276	284.9252	3750.898493	6.76	19.37	8.70	1130.86	8.41
0.60	25340.80826	29.17841609	284.9504	3832.502751	6.61	19.16	11.84	1322.35	8.75
0.62	25333.26032	29.1799896	284.935	3818.718018	6.63	19.29	14.16	1452.19	8.91
0.62	25318.7955	29.18583705	284.8779	3753.038527	6.75	19.42	17.40	1609.91	9.13
0.64	25310.30413	29.19016405	284.8357	3745.294954	6.76	19.29	23.05	1925.68	9.49
0.67	25298.20382	29.19627249	284.7761	3739.9597	6.76	19.27	33.84	2359.23	9.78
0.69	25292.71301	29.19825556	284.7567	3765.909924	6.72	19.14	46.37	2930.84	10.17
0.73	25286.38445	29.21682255	284.5758	3779.72681	6.69	19.44	63.28	3584.73	10.53
0.74	25280.60839	29.2180977	284.5634	3775.537234	6.70	19.93	77.45	4052.81	10.79
0.75	25272.77807	29.22680487	284.4786	3746.994204	6.74	20.58	92.59	4462.56	10.99
0.77	25267.54693	29.22227303	284.5227	3742.901239	6.75	19.27	107.82	4847.14	11.12
0.46	25323.53453	29.12669119	285.4564	4247.634363	5.96	20.00		4377.68	5.97
0.48	25814.28275	29.13314839	285.3931	4552.759129	5.67	18.42	1.22	2418.28	6.70
0.50	25809.57344	29.135608	285.369	4723.18894	5.46	18.53	1.52	1884.72	6.97
0.51	25801.27945	29.1380721	285.3449	4788.73923	5.39	18.53	2.06	1614.41	7.12
0.54	25796.79204	29.15045514	285.2237	4976.808272	5.18	19.41	3.91	1363.10	7.79
0.56	25778.65769	29.15756667	285.1541	4980.823181	5.18	19.31	6.12	1366.62	8.07
0.61	25761.51536	29.16806968	285.0514	5060.800233	5.09	19.25	9.25	1575.82	8.57
0.63	25748.23011	29.17795479	284.9549	5120.118309	5.03	19.25	13.41	1875.61	9.02
0.66	25736.74373	29.18859127	284.851	5216.390563	4.93	19.36	22.26	2432.12	9.46
0.69	25723.51203	29.19861571	284.7532	5265.548344	4.89	19.04	34.08	3167.15	10.05
0.72	25708.76383	29.20547094	284.6864	5274.576775	4.87	19.54	43.55	3620.30	10.34
0.75	25706.5941	29.21821238	284.5622	5342.857184	4.81	20.06	56.30	4205.11	10.62
0.76	25707.03194	29.2246321	284.4997	5428.400955	4.74	19.91	70.96	4726.33	10.85

Table 10

[illegible]

n-Heptane Data

32

Table 11

Table 11								
Methane Data								
	A	M	R	B	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)
P lab (Pa)								
99574	25128.00691	28.26512606	294.1575418	3458.581965	7.27	17.92	2.14	3570.59
99582	25115.9423	28.23264286	294.4959862	3489.773914	7.20	18.15	0.69	2701.35
99591	25104.05941	28.20476533	294.7870654	3466.798899	7.24	17.82	1.10	2270.14
99565	25090.3157	28.17940021	295.0524119	3507.523508	7.15	18.03	2.01	1800.16
99556	25078.38815	28.15542192	295.3036905	3486.52641	7.19	18.11	5.22	1632.89
99547	25066.57797	28.13378129	295.5308394	3476.669526	7.21	18.65	4.75	1517.79
99538	25052.09982	28.12361148	295.6377066	3427.166024	7.31	18.92	5.37	1517.15
99529	25043.00578	28.1087059	295.7944784	3385.46248	7.40	18.68	6.49	1535.12
99521	25034.4977	28.07888183	296.1086574	3374.070249	7.42	18.81	8.80	1642.21
99512	25032.84955	28.06094994	296.2978808	3419.56762	7.32	18.67	11.44	1775.02
99503	25024.45293	28.02985455	296.6265839	3438.292468	7.28	18.70	15.03	2114.79
99494	25014.78746	28.00577623	296.8816123	3416.48789	7.32	18.81	19.50	2461.38
99485	25004.37273	27.973732312	297.2217879	3372.030817	7.42	18.71	23.38	2718.44
99476	25002.68595	27.95483344	297.422627	3431.770842	7.29	18.68	28.72	3250.19
99468	24989.48486	27.91040984	297.8960198	3386.209378	7.38	18.72	39.52	4150.89
99459	24987.97784	27.88323553	298.1863418	3430.843443	7.28	18.51	43.29	4627.36
99450	24978.38371	27.87757746	298.246862	3367.215793	7.42	18.84	49.92	4879.25
100500	25487.03118	28.21808797	294.6478871	4206.943483	6.06	17.58	0.20	4309.36
100500	25468.32522	28.20572092	294.7770782	4198.81045	6.07	17.19	1.04	3409.78
100500	25427.87165	28.17110793	295.1392619	4173.680611	6.09	16.67	3.26	2325.92
100500	25431.75782	28.16116299	295.2434884	4222.828814	6.02	16.83	5.57	2255.80
100500	25393.70143	28.14967374	295.3639916	4051.582408	6.27	16.35	5.41	1931.82
100500	25385.14943	28.13500239	295.5180129	4033.589101	6.29	16.24	4.96	1923.68
100500	25369.98645	28.10354505	295.8487972	4016.859098	6.32	16.12	8.57	1849.92
100500	25354.59351	28.08557258	296.0381162	3949.612353	6.42	16.28	11.06	1862.91
100500	25338.90552	28.05168852	296.3957051	3900.353197	6.50	16.12	10.65	2002.02
100500	25325.14972	28.01500749	296.7837864	3888.280333	6.51	16.22	14.35	2349.18
100500	25320.87226	27.98528525	297.0989906	3925.161325	6.45	15.92	20.32	2686.06
100500	25308.06831	27.97119344	297.2486683	3823.159336	6.62	15.95	20.86	2822.67
100500	25308.91687	27.9480319	297.4950089	3909.246597	6.47	15.68	26.22	3347.07
100500	25306.98012	27.92906854	297.6970029	3951.65241	6.40	15.93	33.05	3936.19

Table 12

[illegible]

Table 12 cont

[illegible]

Table 13

Ethylbenzene data																			
P lab (Pa)	A	M	R	B	Tau (ms)	Vaporizer (C)	NOx (ppmV)	CO (ppmV)											
99500	25105.78633	29.70579983		279.8914706	7.46	53.93	5.36	2695.95											
100700	25411.39172	29.71937346		279.7636367	7.34	55.44	1.13	2361.67											
100700	25401.61454	29.7330713		279.6347514	7.39	55.00	0.75	2149.83											
99500	25093.56203	29.73600386		279.6071738	7.37	54.78	0.38	2053.52											
99500	25093.61139	29.74337462		279.5378838	7.28	57.26	1.14	1925.28											
100700	25393.6882	29.75484233		279.4301481	7.30	57.09	0.85	1858.60											
100700	25385.88662	29.77522887		279.2388276	7.32	56.09	1.33	1720.18											
99500	25076.81924	29.7772468		279.2199042	7.34	55.10	0.94	1705.42											
100700	25373.99973	29.79700392		279.0347655	7.37	55.97	3.17	1633.47											
100700	25369.00176	29.80854461		278.9267343	7.39	55.02	3.66	1607.59											
99500	25063.0426	29.81528183		278.8637064	7.36	54.61	2.92	1643.72											
100700	25356.80214	29.84272391		278.6072754	7.42	56.59	3.81	1647.36											
99500	25051.03427	29.85086492		278.5312928	7.40	54.84	4.92	1696.17											
100700	25344.8229	29.86989759		278.3538168	7.46	55.43	7.92	1724.00											
100700	25344.86909	29.87856041		278.2731124	7.45	60.12	5.79	1746.88											
99500	25039.226	29.89750589		278.0967761	7.38	54.87	9.05	1939.23											
100700	25342.67646	29.90935292		277.9866225	7.35	55.57	10.51	1978.49											
99500	25030.07655	29.92508967		277.8404373	7.42	54.91	12.42	2167.11											
100700	25332.43132	29.94211137		277.6824886	7.40	54.89	13.59	2232.11											
100700	25323.57091	29.96913811		277.4320693	7.45	55.23	15.93	2483.72											
99500	25015.95065	29.97804876		277.3496056	7.52	53.92	17.52	2621.22											
99500	25015.99761	29.98844693		277.2534376	7.44	54.10	21.97	2827.99											
99500	25016.04057	29.99795448		277.1655649	7.38	53.92	24.15	2979.56											
100700	25306.35954	30.02074036		276.955195	7.65	57.67	26.38	2986.08											
100700	25306.4773	30.04847967		276.6995232	7.50	54.35	35.54	3581.27											
100700	25300.36539	30.07084015		276.4937713	7.59	53.87	40.46	3834.20											
99500	24997.33262	30.07497537		276.4557542	7.51	52.73	45.24	4127.74											
100700	25300.41526	30.08307918		276.3812823	7.50	53.55	46.61	4156.90											
99500	24991.35007	30.10300241		276.1983634	7.51	52.88	57.48	4712.86											
100700	25290.37988	30.13281195		275.9251282	7.57	54.01	66.43	4865.59											

Table 13 cont

[illegible]

Cyclohexane data

[illegible]

Table 14 cont

[illegible]

Table 15

[illegible]

POSF 2926 Neat data

41

Table 17

[illegible]

Table 17 cont

[illegible]

APPENDIX B
STEP SWIRL COMBUSTOR (SSC)
(SELECTED DATA SET)

Table 1 Swirler Vane Angles and Swirler Vane Lengths for the SSC

Inner swirler (6 vanes)

Vane angle (degrees)	Direction	Length (mm)
30	clockwise	25
30	counter-clockwise	25
45	clockwise	19
45	counter-clockwise	19
60	clockwise	19
60	counter-clockwise	19

Outer swirler (12 vanes)

Vane angle (degrees)	Direction	Length (mm)
30	clockwise	32
45	clockwise	25
60	clockwise	25

Table 2 Flame Length Measurements in the SSC
(stoichiometric conditions using propane fuel)

Vane angle combination (θ/θ_0), degrees	Air velocity combination (U/U_0), m/s					
Co-swirl	16/8	32/8	48/8	16/16	32/16	48/16
30/30	150	127	162	66	86	122
45/30	56	81	111	71	76	117
60/30	66	86	127	71	91	152
30/60	51	127	193	41	56	76
45/60	35	56	71	41	46	51
60/60	25	71	132	46	51	61
Counter-swirl						
30/30	86	182	238	66	101	172
45/30	61	147	127	71	86	182
60/30	117	111	127	76	182	203
30/60	76	162	213	41	56	117
45/60	35	61	127	41	51	66
60/60	41	157	122	51	51	76

Table 3 Lean Blowouts (Equivalence Ratios) in the SSC
(propane fuel)

Vane angle combination (θ/θ_0), degrees	Air velocity combination (U/U_0), m/s					
	16/8	32/8	48/8	16/16	32/16	48/16
Co-swirl						
30/30	0.38	0.42	0.45	0.43	0.44	0.45
45/30	0.41	0.42	0.43	0.44	0.45	0.46
60/30	0.42	0.43	0.46	0.44	0.45	0.49
30/45	0.10	0.41	0.44	0.43	0.44	0.47
45/45	0.34	0.39	0.41	0.41	0.41	0.45
60/45	0.36	0.42	0.44	0.41	0.43	0.44
30/60	0.37	0.37	0.39	0.41	0.41	0.43
45/60	0.36	0.36	0.38	0.39	0.38	0.40
60/60	0.35	0.39	0.41	0.38	0.40	0.41
Counter-swirl						
30/30	0.29	0.42	0.46	0.41	0.46	0.46
45/30	0.44	0.43	0.44	0.43	0.49	0.47
60/30	0.45	0.42	0.45	0.43	0.49	0.50
30/45	0.10	0.43	0.46	0.44	0.43	0.48
60/45	0.36	0.43	0.46	0.42	0.43	0.44
30/60	0.17	0.41	0.44	0.39	0.41	0.46
45/60	0.36	0.42	0.43	0.41	0.41	0.44
60/60	0.35	0.41	0.42	0.39	0.41	0.43

Table 4 Rich Blowouts (Equivalence Ratios) in the SSC
(propane fuel)

Vane angle combination (θ/θ_0), degrees	Air velocity combination (U/U_0), m/s					
	16/8	32/8	48/8	16/16	32/16	48/16
Co-swirl						
30/45	2.07	1.86	2.02	2.13	2.16	1.97
45/45	1.98	1.91	1.79	2.07	2.07	
60/45			1.70		2.02	
45/60	2.04	1.97		2.02	2.07	
Counter-swirl						
30/45	2.08	1.90	2.05			

Table 5 Test Conditions for the Swirl Combustor for PDF Model Validation

LDA		
Annulus	Swirl Angle	U_i
Air jet	45° swirl	100 m/s
Air jet	45° swirl	25 m/s
Air jet	60° swirl	25 m/s
Hydrogen jet	No swirl	25 m/s
Hydrogen jet	No swirl	100 m/s
Hydrogen jet	30° swirl	100 m/s
Hydrogen jet	45° swirl	100 m/s
CARS		
Annulus	Swirl Angle	U_i
Hydrogen jet	No swirl	25 m/s
Hydrogen jet	No swirl	100 m/s
Hydrogen jet	30° swirl	100 m/s
Hydrogen jet	45° swirl	100 m/s

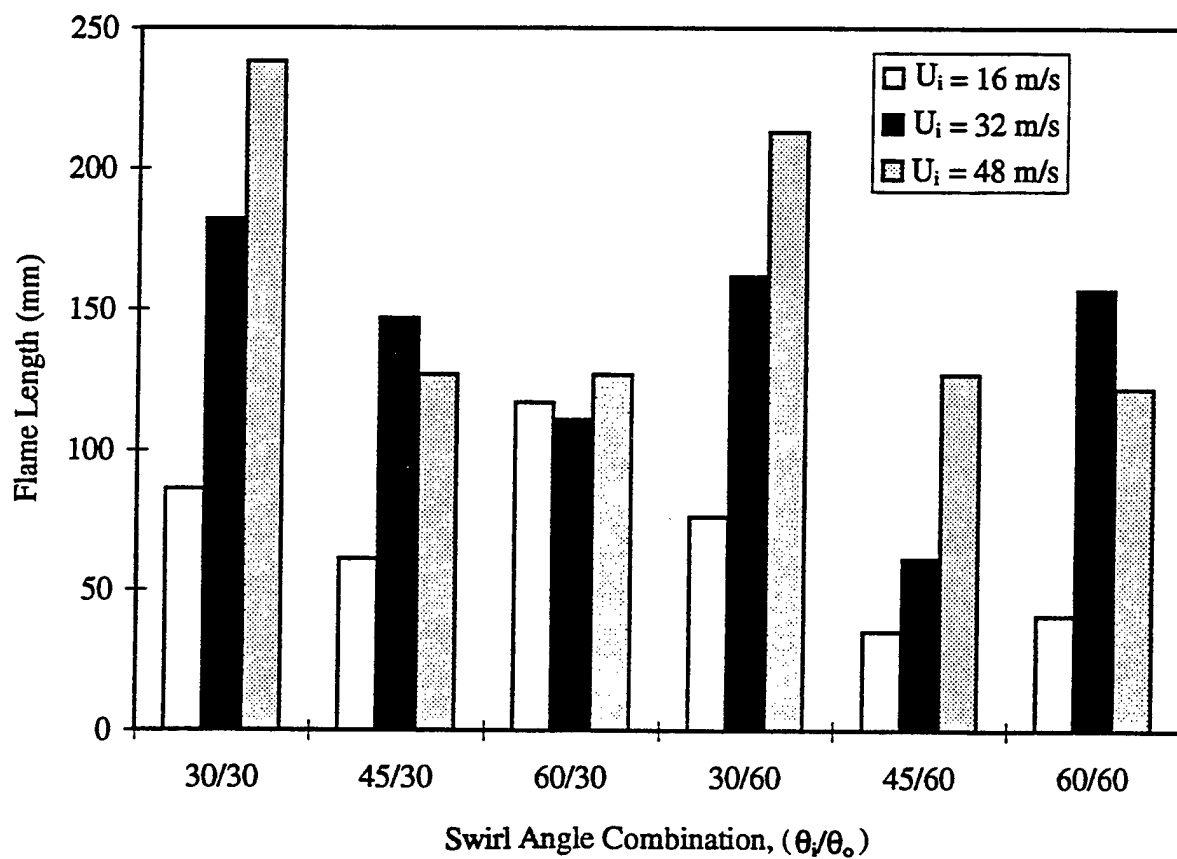


Figure 1 Variation of flame length with swirl angle combinations at three different values of inner air velocity ($U_o = 8$ m/s, counter-swirl, propane, stoichiometric conditions).

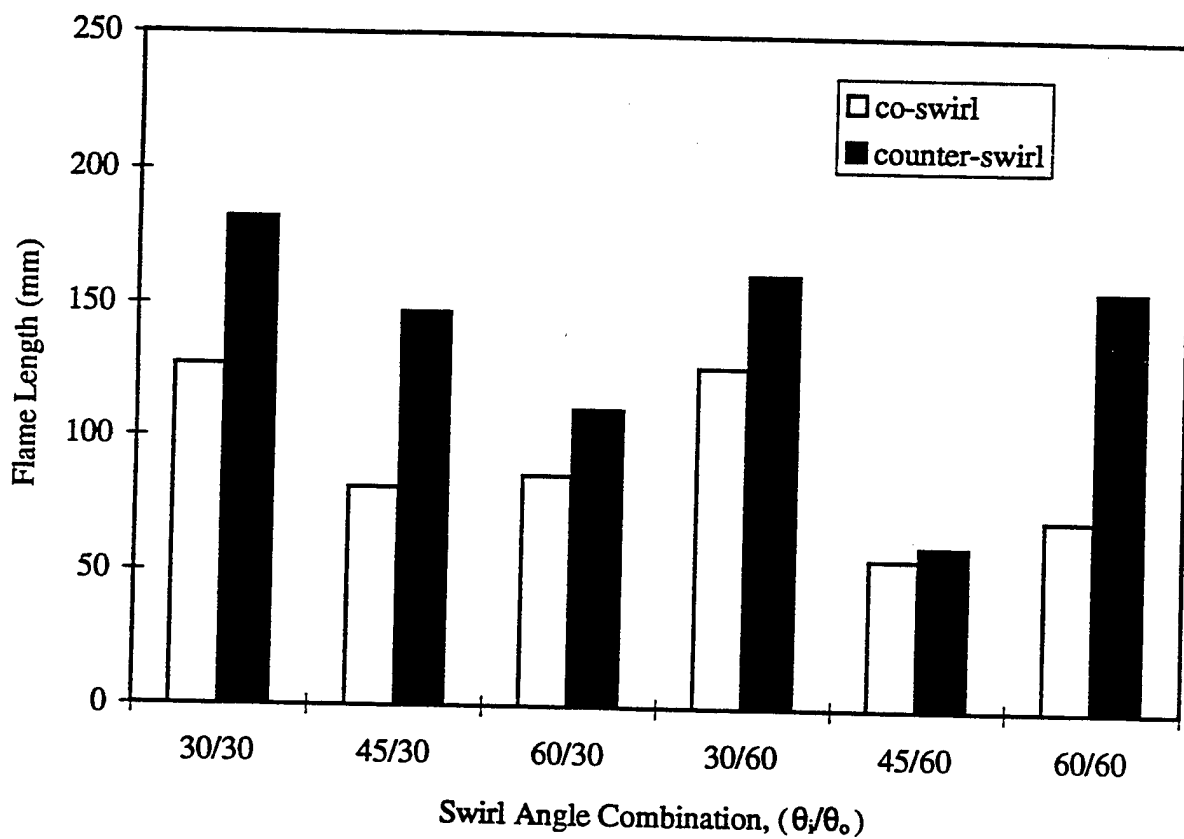


Figure 2 A comparison of flame lengths with co- and counter-swirl arrangements for a variety of swirl angle combinations ($U_i = 32$ m/s, $U_o = 8$ m/s, propane, stoichiometric conditions).

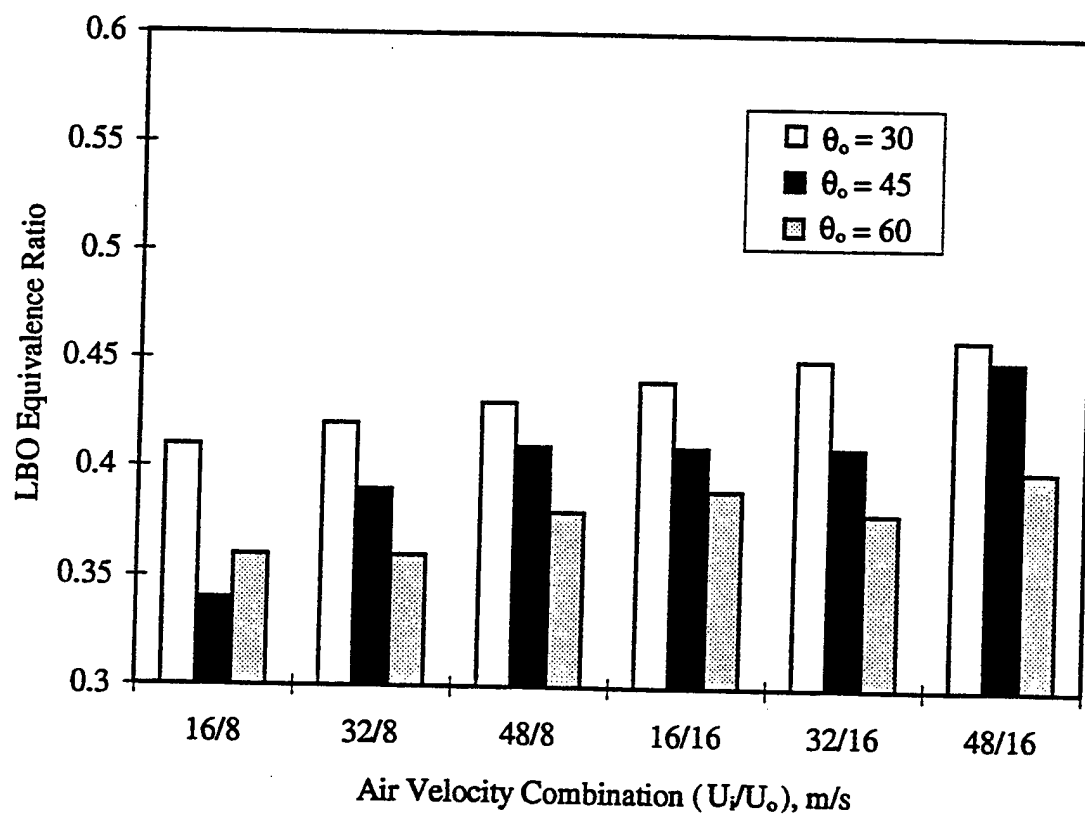


Figure 3 Effect of outer swirl angle on LBO for a variety of air velocity combinations ($\theta_i = 45^\circ$, co-swirl, propane).

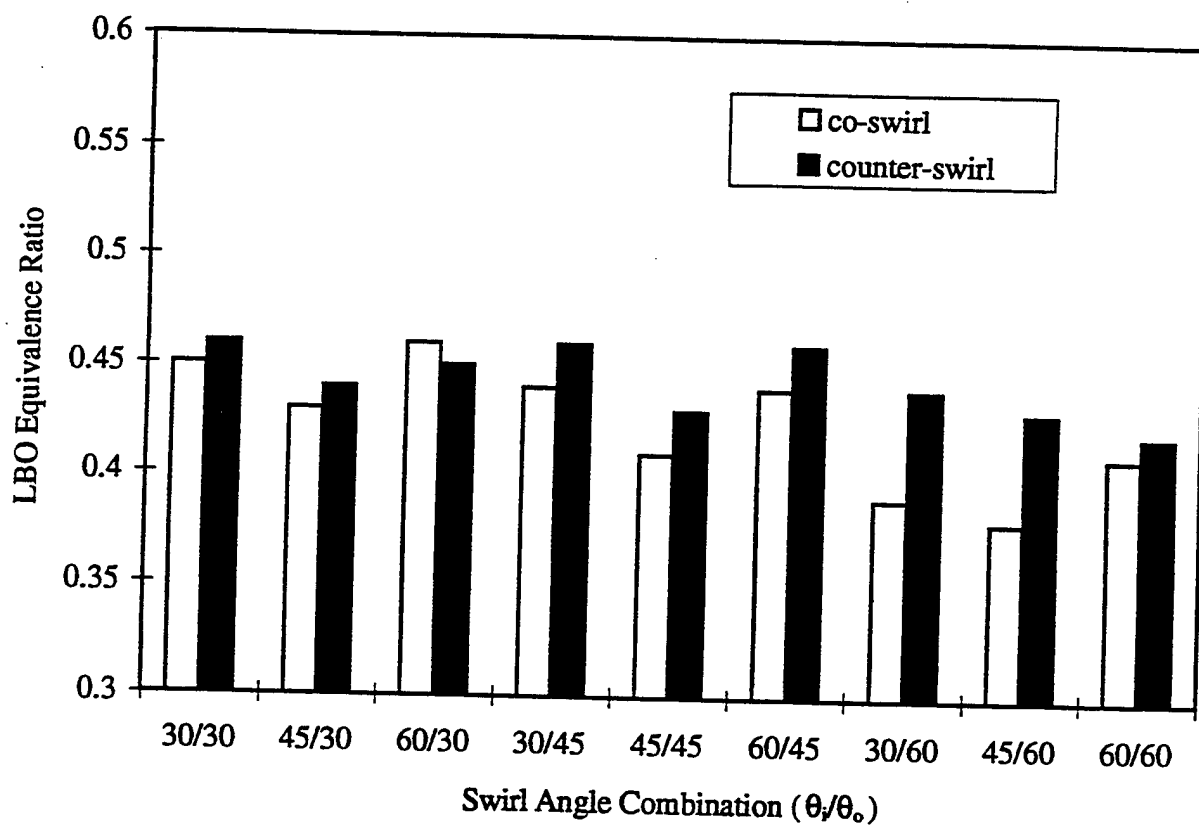


Figure 4 A comparison of LBO data for co- and counter-swirl arrangements for a variety of swirl angle combinations ($U_i = 48$ m/s, $U_o = 8$ m/s, propane).

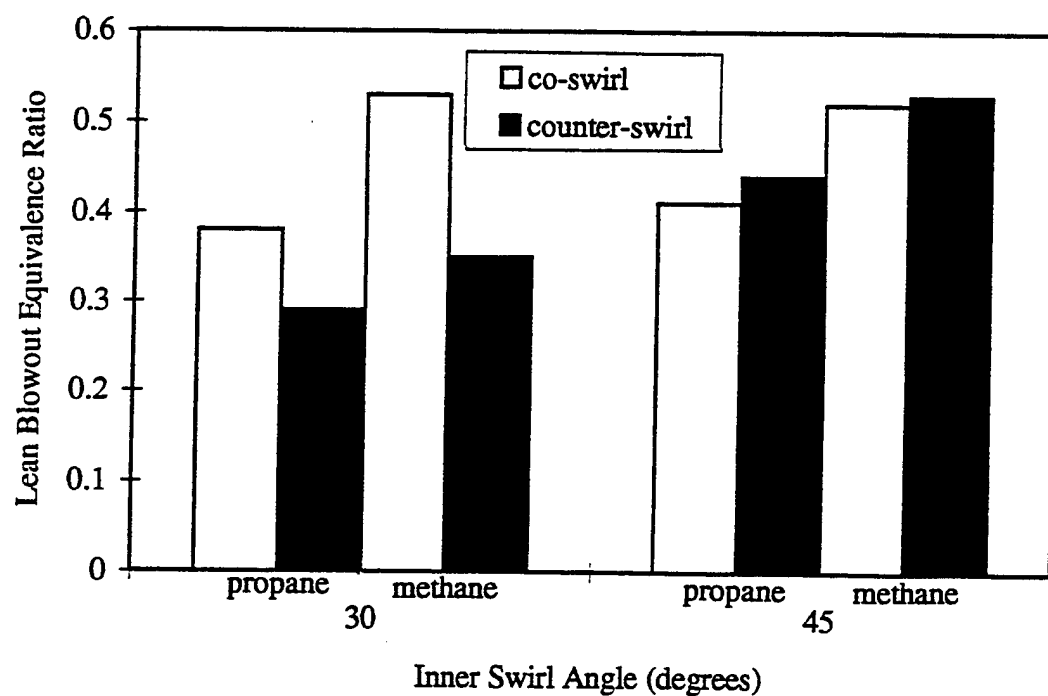


Figure 5 LBO data comparing inner swirl angle (θ_i), co-swirl and counter-swirl, and methane with propane ($\theta_o = 30^\circ$, $U_i = 14.4$ m/s, $U_o = 8.6$ m/s).

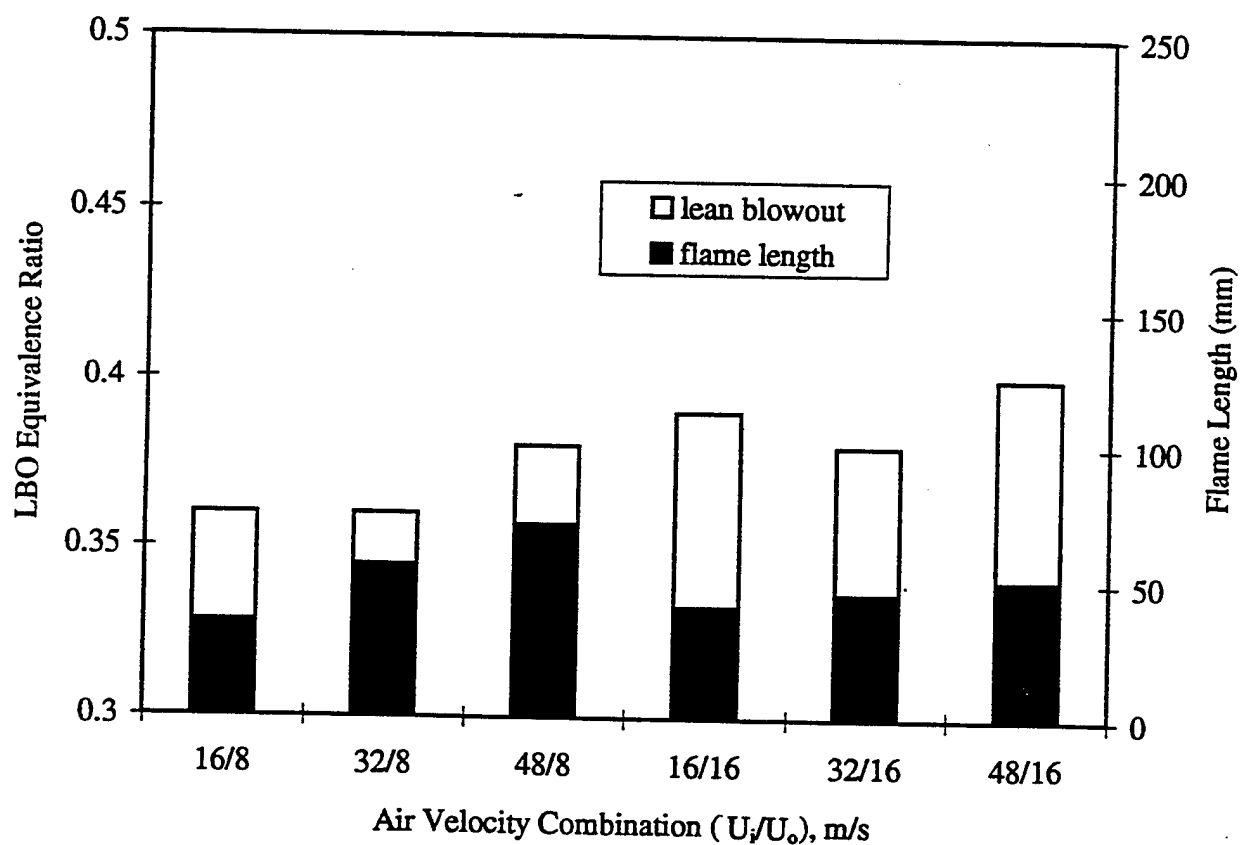


Figure 6 Variation of LBO and flame length with air velocity combinations for an optimum swirl angle configuration, $\theta_i = 45^\circ$, $\theta_o = 60^\circ$, co-swirl (propane, flame length at stoichiometric conditions).

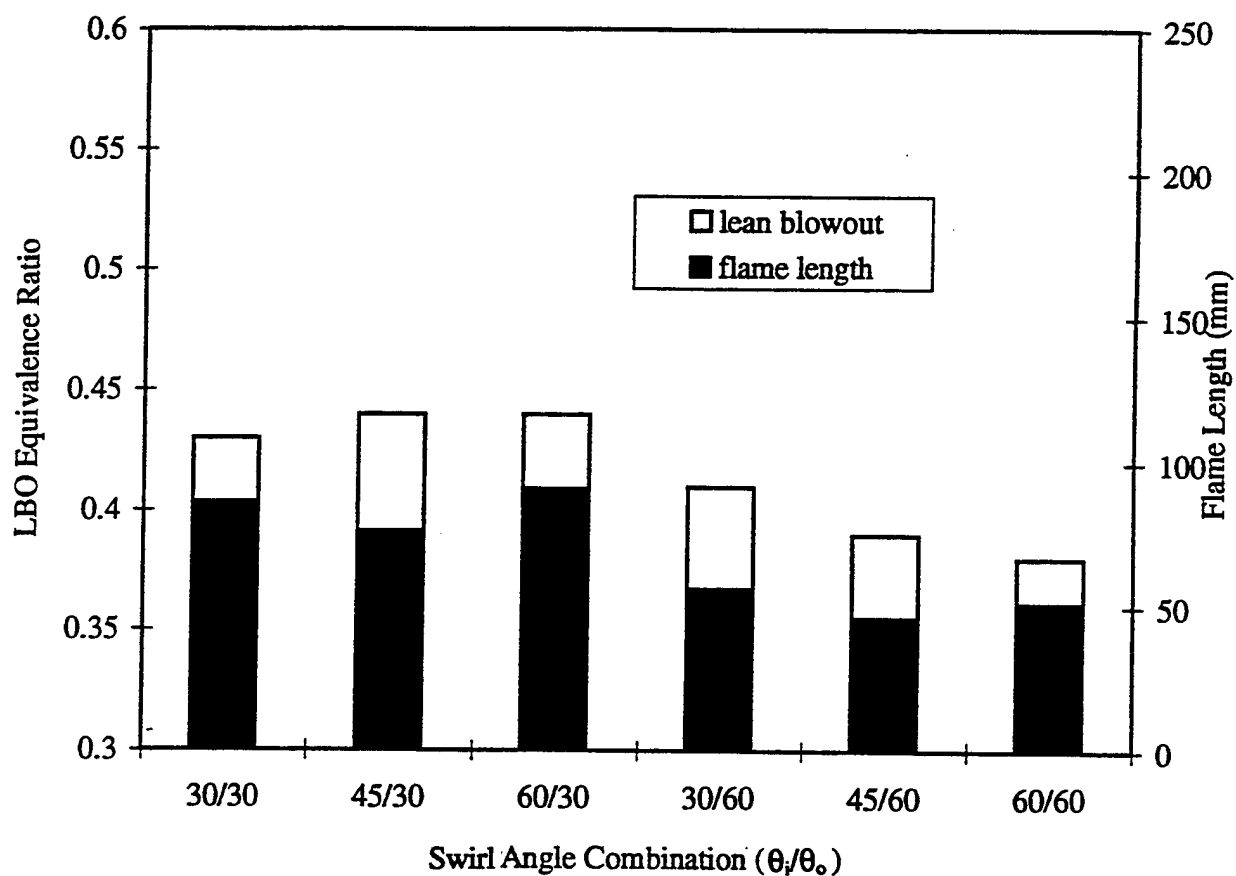


Figure 7 , Variation of LBO and flame length with swirl angle combinations for an optimum air velocity split, $U_i = U_o = 16$ m/s (co-swirl, propane, flame length at stoichiometric conditions).

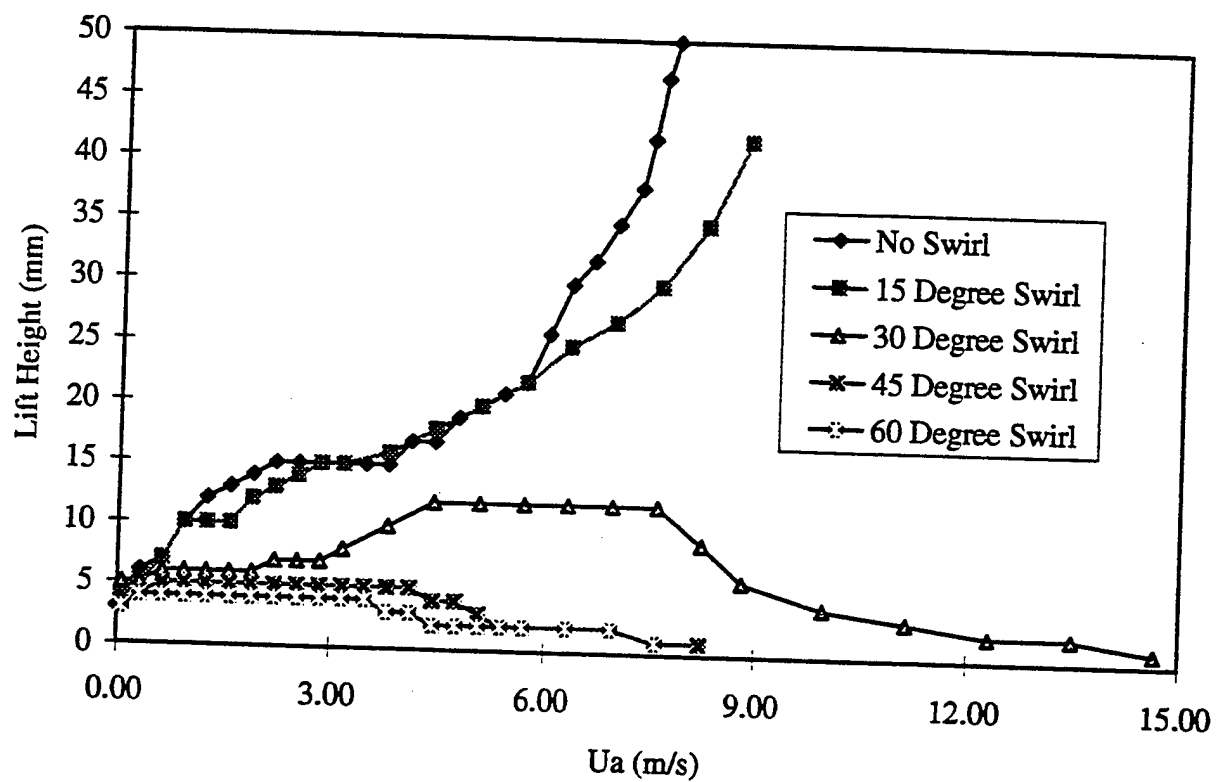


Figure 8 Lift heights at critical points in a double-concentric hydrogen-air jet diffusion flame for jet tube diameter of 2.39 mm for no swirl, 15°, 30°, 45°, and 60° swirl.

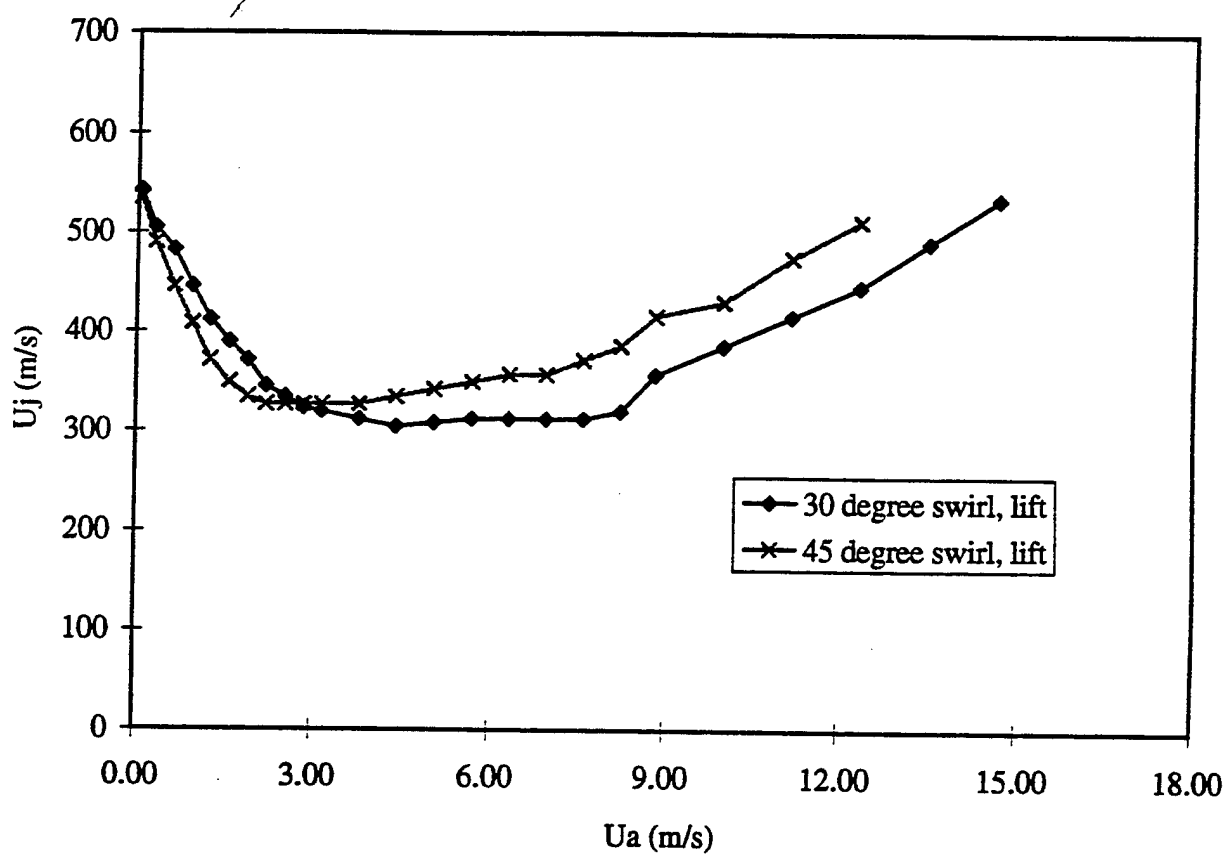


Figure 9 Stabilization effects of swirl in a double-concentric hydrogen-air jet diffusion flame for jet tube diameter of 2.39 mm.

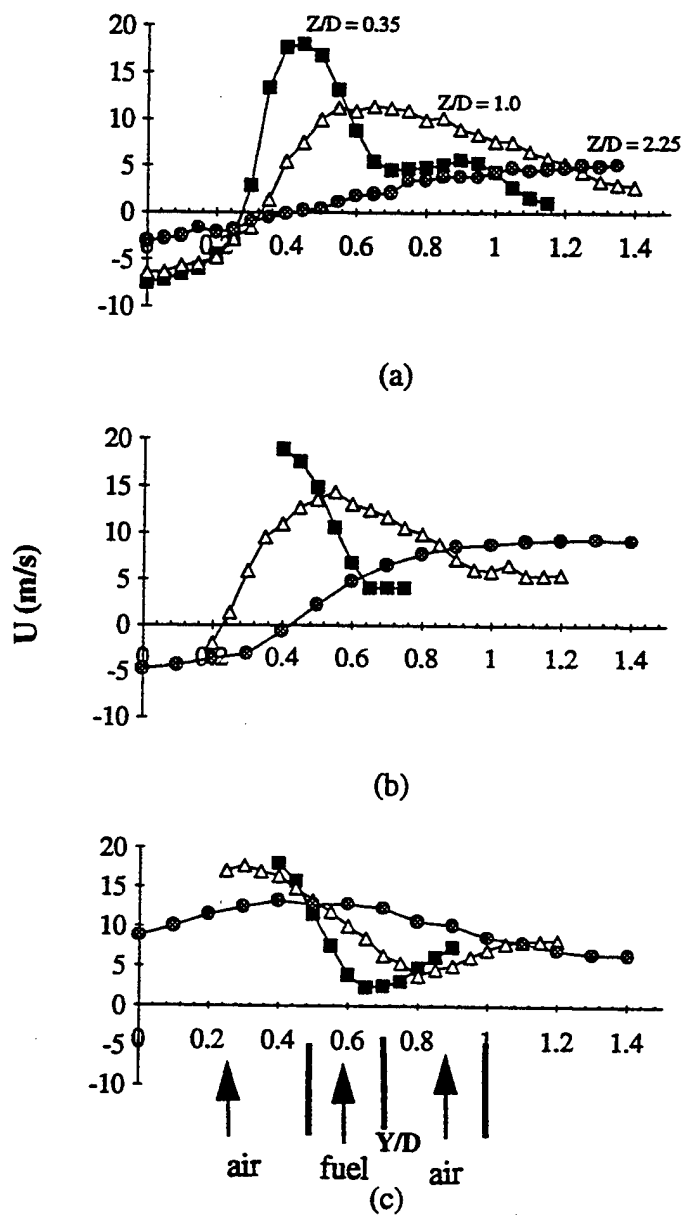


Figure 10a-c Radial variation of mean axial velocity at three different locations downstream of the fuel nozzle: (a) cold flow co-swirl, (b) hot flow co-swirl, (c) hot flow counter-swirl.

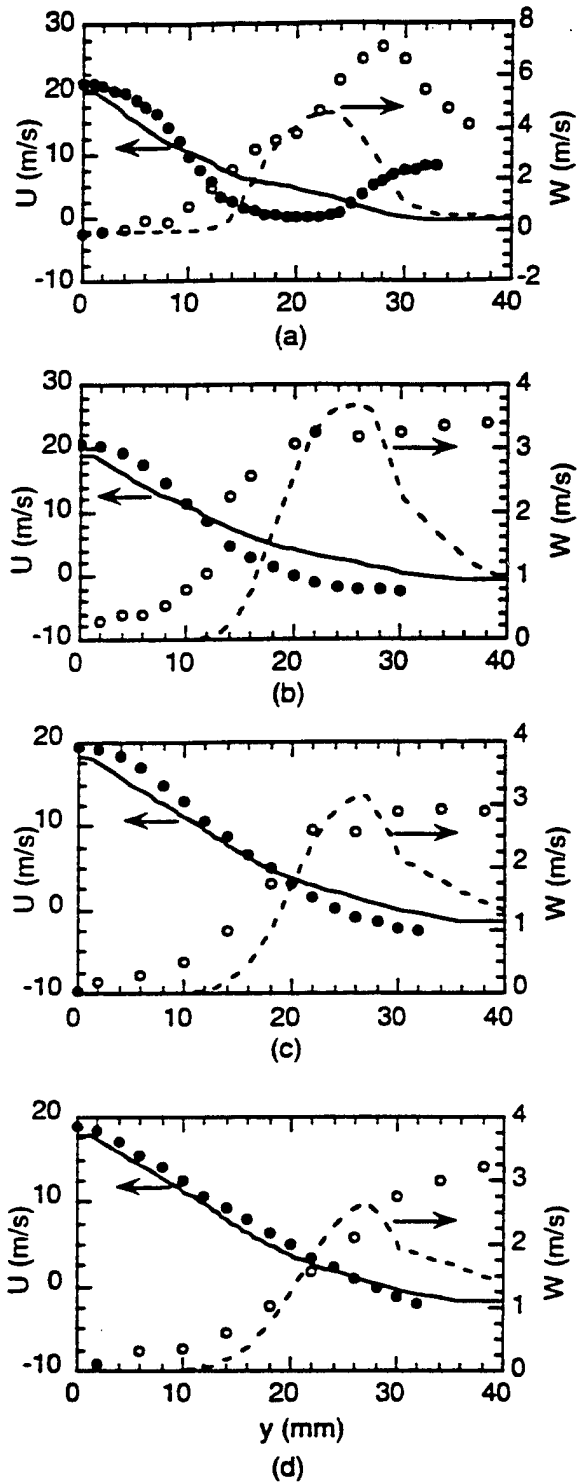


Figure 11 Calculated (lines) and measured (symbols) axial and swirl velocities for $\theta_i = 0^\circ$ case at axial locations (a) 20 mm, (b) 40 mm, (c) 60 mm, and (d) 80 mm.

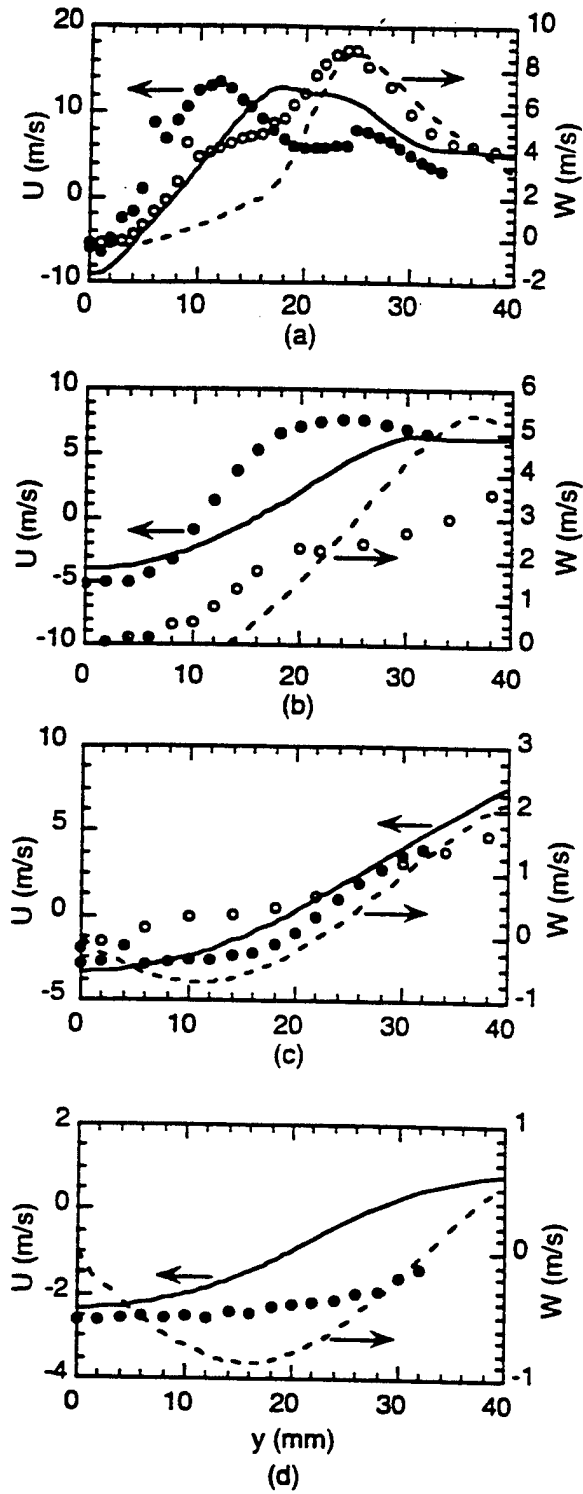


Figure 12: Calculated (lines) and measured (symbols) axial and swirl velocities for $\theta_i = 30^\circ$ case at axial locations (a) 20 mm, (b) 40 mm, (c) 60 mm, and (d) 80 mm.

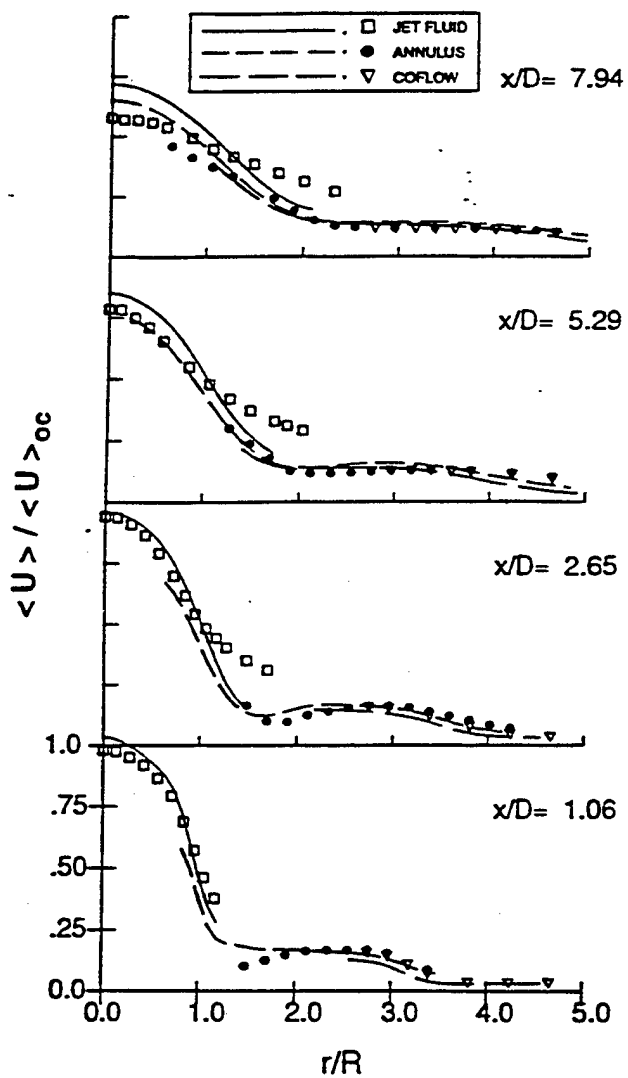


Figure 13 Radial profiles of computed conditional mean axial velocity (lines) compared against data (symbols) for the 30° swirl case.

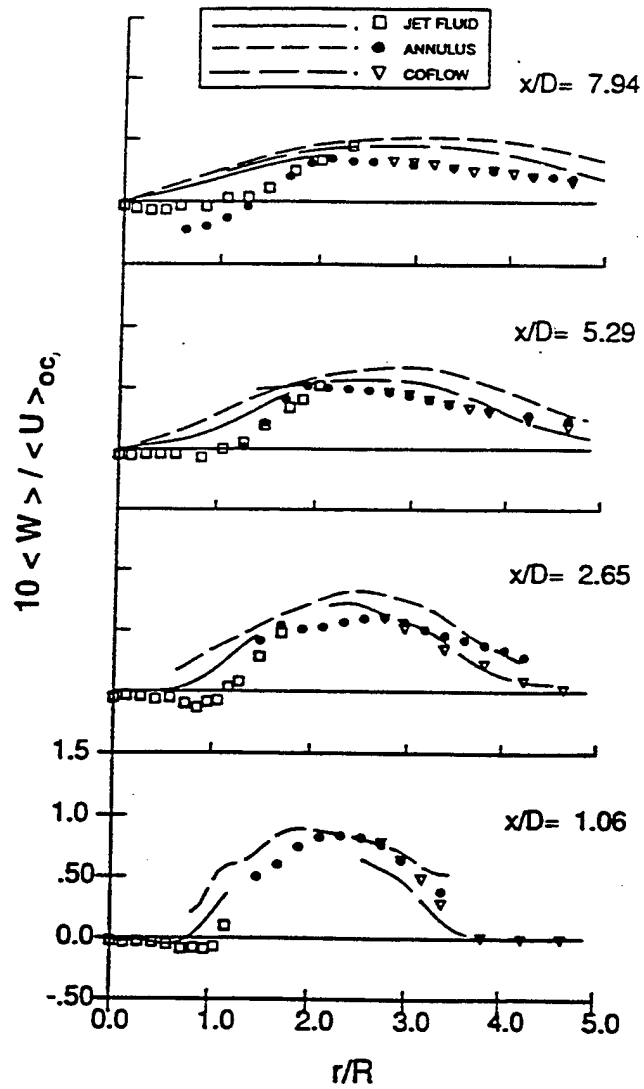


Figure 14 Radial profiles of computed conditional mean tangential velocity (lines) compared against data (symbols) for the 30° swirl case.

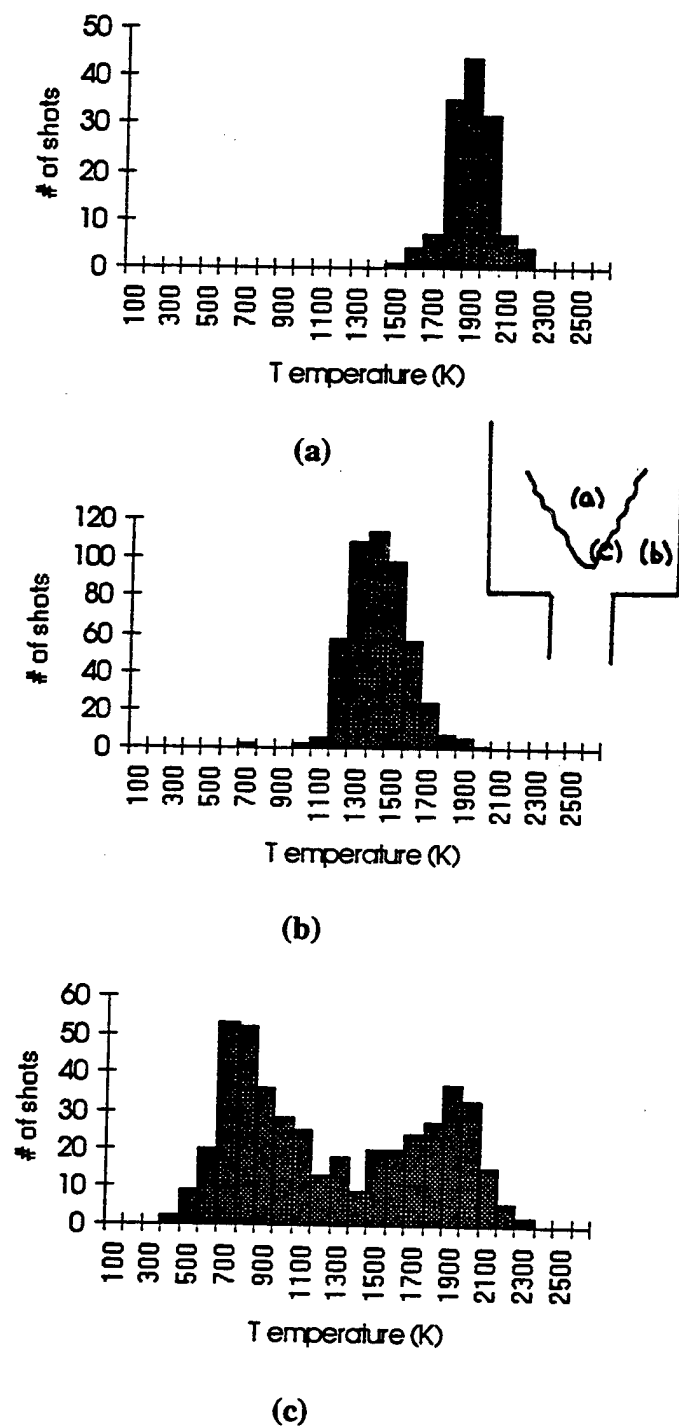
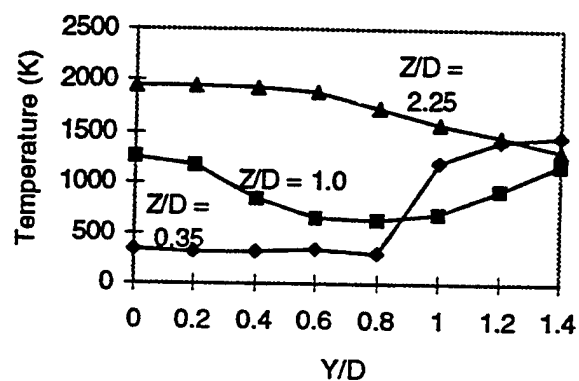
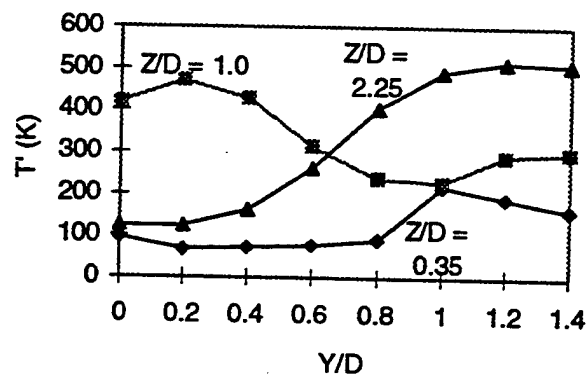


Figure 15a-c : PDF of CARS temperatures for (a) hot gas state, (b) intermediate gas state, and (c) bimodal gas state.

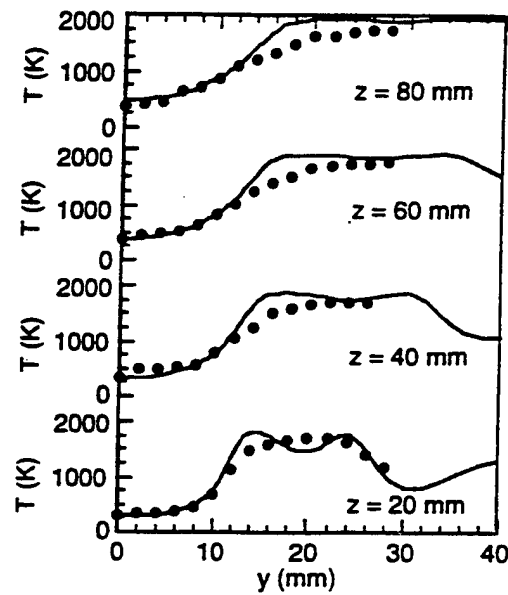


(a)

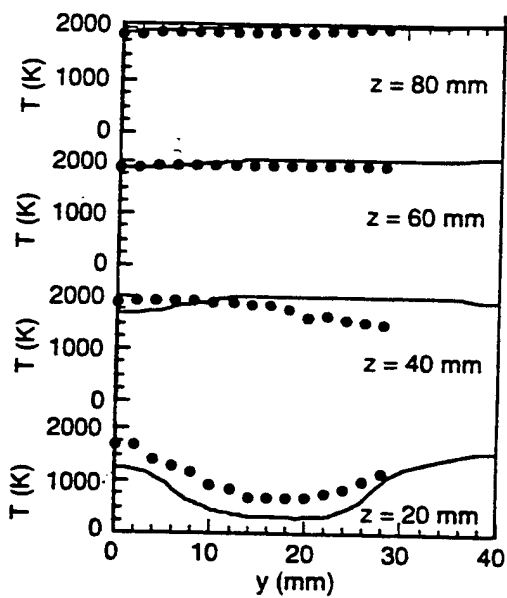


(b)

Figure 16a-b Radial variation of CARS (a) mean temperature and (b) rms temperature at three different downstream locations in the SSC.



(a)



(b)

Figure 17a-b Radial temperature profiles at different axial locations for (a) $\theta_i = 0^\circ$, and (b) $\theta_i = 30^\circ$ co-swirl [calculated (lines), data (symbols)].

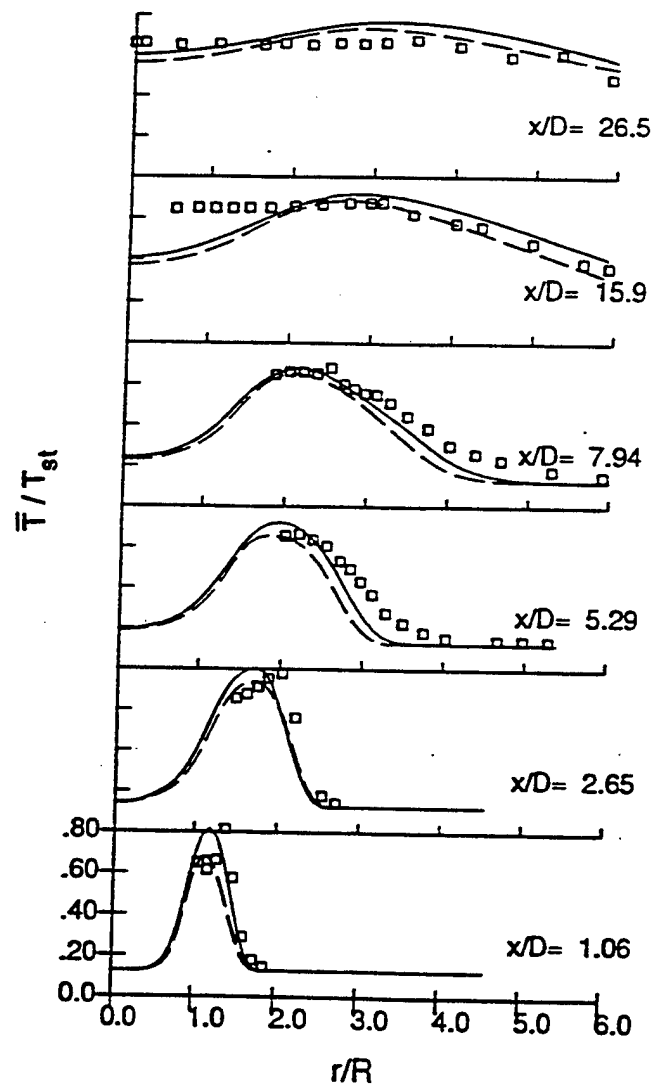


Figure 18 Computed radial profiles of Reynolds-averaged mean temperature with (solid lines) and without (dotted lines) the inclusion of molecular diffusion compared against CARS data (symbols) for the 30° swirl case.

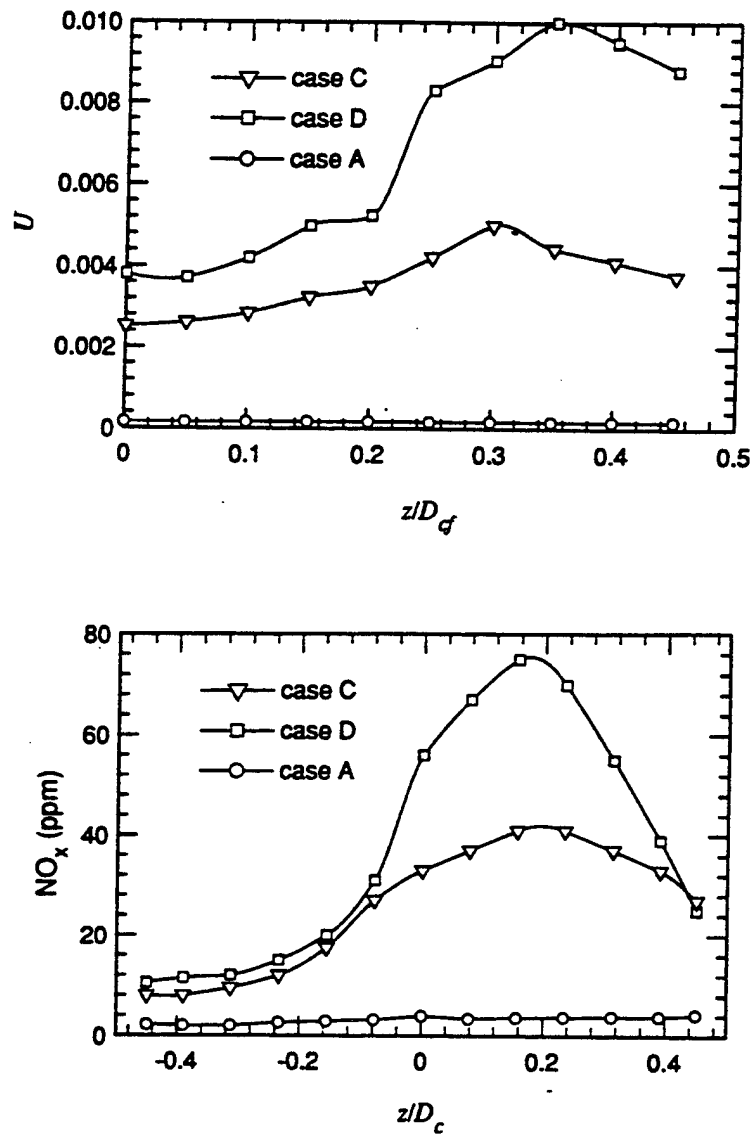


Figure 19 Profiles of unmixedness parameter U and corresponding profiles of NO_x emissions.

APPENDIX C
SWIRLING JET DIFFUSION FLAME
(SELECTED DATA SET)

Filename Format

The data set for the measurements of swirling and nonswirling turbulent hydrogen jet diffusion flames is stored in an electronic form (ASCII format) and available on request from Dr. F. Takahashi (e-mail: ftakahas@engr.udayton.edu). A brief description of the measurements is also available on the World Wide Web page (<http://www.ca.sandia.gov/tdf/DataSums/TakahashH2.html>). Each data file is headed with a FILENAME. The FILENAMEs have the following format for the velocity and temperature data: *JdtsVzzz.PPn* (upper case: letter, lower case: number). The definitions of these characters are listed below.

J: type of jet fluid

If *J* = A, air
 = H, hydrogen

d: fuel tube diameter (*d*)

If *d* = 9, *d* = 9.45 mm

t: fuel tube lip thickness (*δ*)

If *t* = 0, *δ* = 0.2 mm
 = 1, *δ* = 1.2 mm

s: swirler helix angle (*θ*)

If *s* = 0, *θ* = 0
 = 1, *θ* = 15
 = 3, *θ* = 30
 = 4, *θ* = 45
 = 6, *θ* = 60

V: average velocities at the jet exit plane

If *V* = A, *U_j* = 100, *U_a* = 20, *U_e* = 4 m/s
 = B, *U_j* = 25, *U_a* = 4, *U_e* = 1 m/s

zzz: radial profile's axial position (*x*) or axial profile

If *zzz* = a number, the file is a radial profile at axial position *zzz*
 e.g., 001, *x* = 1.5 mm
 010, *x* = 10 mm
 025, *x* = 25 mm
 050, *x* = 50 mm
 075, *x* = 75 mm
 150, *x* = 150 mm
 225, *x* = 225 mm
 = AX, the file is an axial profile along the jet centerline (*y* = 0).

PP: LDV particle seeding method.

If *PP* = J_, the velocity data with particles added to jet fluid only
 = A_, the velocity data with particles added to annulus fluid only
 = E_, the velocity data with particles added to external fluid only
 = T, the temperature data

n: file ID number, 1 or 2.

If *n* = 1, the file includes *r*, *z*, *U*, *V*, *W*, (*u'*), (*v'*), (*w'*), *u'v'*, *v'w'*, *w'u'*
 = 2, the file includes *r*, *z*, *u'³*, *v'³*, *w'³*, *u'²v'*, *v'²u'*, *v'²w'*, *w'²v'*, *w'²u'*,
 u'²w', *u'⁴*, *v'⁴*, *w'⁴*

Table C1 Data Filenames and Test Conditions

Filename	Extension		θ	U_j (m/s)	U_a (m/s)	U_e (m/s)	x (mm)	Seed
H900B001	.J_1	.j_2	0°	25	4	1	1.5	Jet
H900B001	.A_1	.A_2	0°	25	4	1	1.5	Annulus
H900B001	.E_1	.E_2	0°	25	4	1	1.5	External
H900B010	.J_1	.j_2	0°	25	4	1	10	Jet
H900B010	.A_1	.A_2	0°	25	4	1	10	Annulus
H900B010	.E_1	.E_2	0°	25	4	1	10	External
H900B025	.J_1	.j_2	0°	25	4	1	25	Jet
H900B025	.A_1	.A_2	0°	25	4	1	25	Annulus
H900B025	.E_1	.E_2	0°	25	4	1	25	External
H900B050	.J_1	.j_2	0°	25	4	1	50	Jet
H900B050	.A_1	.A_2	0°	25	4	1	50	Annulus
H900B050	.E_1	.E_2	0°	25	4	1	50	External
H900B075	.J_1	.j_2	0°	25	4	1	75	Jet
H900B075	.A_1	.A_2	0°	25	4	1	75	Annulus
H900B075	.E_1	.E_2	0°	25	4	1	75	External
H900B150	.J_1	.j_2	0°	25	4	1	150	Jet
H900B150	.A_1	.A_2	0°	25	4	1	150	Annulus
H900B150	.E_1	.E_2	0°	25	4	1	150	External
H900B225	.J_1	.j_2	0°	25	4	1	225	Jet
H900B225	.A_1	.A_2	0°	25	4	1	225	Annulus
H900B225	.E_1	.E_2	0°	25	4	1	225	External
H900BAX	.J_1	.j_2	0°	25	4	1	1.5-225	Jet
H910A001	.J_1	.j_2	0°	100	20	4	1.5	Jet
H910A001	.A_1	.A_2	0°	100	20	4	1.5	Annulus
H910A001	.E_1	.E_2	0°	100	20	4	1.5	External

H910A010	.J_1	.j_2	0°	100	20	4	10	Jet
H910A010	.A_1	.A_2	0°	100	20	4	10	Annulus
H910A010	.E_1	.E_2	0°	100	20	4	10	External
H910A025	.J_1	.j_2	0°	100	20	4	25	Jet
H910A025	.A_1	.A_2	0°	100	20	4	25	Annulus
H910A025	.E_1	.E_2	0°	100	20	4	25	External
H910A050	.J_1	.j_2	0°	100	20	4	50	Jet
H910A050	.A_1	.A_2	0°	100	20	4	50	Annulus
H910A050	.E_1	.E_2	0°	100	20	4	50	External
H910A075	.J_1	.j_2	0°	100	20	4	75	Jet
H910A075	.A_1	.A_2	0°	100	20	4	75	Annulus
H910A075	.E_1	.E_2	0°	100	20	4	75	External
H910A150	.J_1	.j_2	0°	100	20	4	150	Jet
H910A150	.A_1	.A_2	0°	100	20	4	150	Annulus
H910A150	.E_1	.E_2	0°	100	20	4	150	External
H910A225	.J_1	.j_2	0°	100	20	4	225	Jet
H910A225	.A_1	.A_2	0°	100	20	4	225	Annulus
H910A225	.E_1	.E_2	0°	100	20	4	225	External
H910AAX	.J_1	.j_2	0°	100	20	4	1.5-225	Jet
H903A001	.J_1	.j_2	30°	100	20	4	1.5	Jet
H903A001	.A_1	.A_2	30°	100	20	4	1.5	Annulus
H903A001	.E_1	.E_2	30°	100	20	4	1.5	External
H903A010	.J_1	.j_2	30°	100	20	4	10	Jet
H903A010	.A_1	.A_2	30°	100	20	4	10	Annulus
H903A010	.E_1	.E_2	30°	100	20	4	10	External
H903A025	.J_1	.j_2	30°	100	20	4	25	Jet
H903A025	.A_1	.A_2	30°	100	20	4	25	Annulus
H903A025	.E_1	.E_2	30°	100	20	4	25	External
H903A050	.J_1	.j_2	30°	100	20	4	50	Jet
H903A050	.A_1	.A_2	30°	100	20	4	50	Annulus
H903A050	.E_1	.E_2	30°	100	20	4	50	External
H903A075	.J_1	.j_2	30°	100	20	4	75	Jet
H903A075	.A_1	.A_2	30°	100	20	4	75	Annulus
H903A075	.E_1	.E_2	30°	100	20	4	75	External
H903A150	.J_1	.j_2	30°	100	20	4	150	Jet
H903A150	.A_1	.A_2	30°	100	20	4	150	Annulus
H903A150	.E_1	.E_2	30°	100	20	4	150	External
H903A225	.J_1	.j_2	30°	100	20	4	225	Jet
H903A225	.A_1	.A_2	30°	100	20	4	225	Annulus
H903A225	.E_1	.E_2	30°	100	20	4	225	External
H903AAX	.J_1	.j_2	30°	100	20	4	1.5-225	Jet
H904A001	.J_1	.j_2	45°	100	20	4	1.5	Jet
H904A001	.A_1	.A_2	45°	100	20	4	1.5	Annulus
H904A001	.E_1	.E_2	45°	100	20	4	1.5	External
H904A010	.J_1	.j_2	45°	100	20	4	10	Jet
H904A010	.A_1	.A_2	45°	100	20	4	10	Annulus
H904A010	.E_1	.E_2	45°	100	20	4	10	External
H904A025	.J_1	.j_2	45°	100	20	4	25	Jet
H904A025	.A_1	.A_2	45°	100	20	4	25	Annulus
H904A025	.E_1	.E_2	45°	100	20	4	25	External
H904A050	.J_1	.j_2	45°	100	20	4	50	Jet

H904A050	.A_1	.A_2	45°	100	20	4	50	Annulus
H904A050	.E_1	.E_2	45°	100	20	4	50	External
H904A075	.J_1	.j_2	45°	100	20	4	75	Jet
H904A075	.A_1	.A_2	45°	100	20	4	75	Annulus
H904A075	.E_1	.E_2	45°	100	20	4	75	External
H904A150	.J_1	.j_2	45°	100	20	4	150	Jet
H904A150	.A_1	.A_2	45°	100	20	4	150	Annulus
H904A150	.E_1	.E_2	45°	100	20	4	150	External
H904A225	.J_1	.j_2	45°	100	20	4	225	Jet
H904A225	.A_1	.A_2	45°	100	20	4	225	Annulus
H904A225	.E_1	.E_2	45°	100	20	4	225	External
H904AAX	.J_1	.j_2	45°	100	20	4	1.5-225	Jet
H900B001	.T		0°	25	4	1	1.5	
H900B010	.T		0°	25	4	1	10	
H900B025	.T		0°	25	4	1	25	
H900B050	.T		0°	25	4	1	50	
H900B075	.T		0°	25	4	1	75	
H900B150	.T		0°	25	4	1	150	
H900B225	.T		0°	25	4	1	225	
H910A001	.T		0°	100	20	4	1.5	
H910A010	.T		0°	100	20	4	10	
H910A025	.T		0°	100	20	4	25	
H910A050	.T		0°	100	20	4	50	
H910A075	.T		0°	100	20	4	75	
H910A150	.T		0°	100	20	4	150	
H910A225	.T		0°	100	20	4	225	
H903A001	.T		30°	100	20	4	1.5	
H903A010	.T		30°	100	20	4	10	
H903A025	.T		30°	100	20	4	25	
H903A050	.T		30°	100	20	4	50	
H903A075	.T		30°	100	20	4	75	
H903A150	.T		30°	100	20	4	150	
H903A225	.T		30°	100	20	4	225	
H904A001	.T		45°	100	20	4	1.5	
H904A010	.T		45°	100	20	4	10	
H904A025	.T		45°	100	20	4	25	
H904A050	.T		45°	100	20	4	50	
H904A075	.T		45°	100	20	4	75	
H904A150	.T		45°	100	20	4	150	
H904A225	.T		45°	100	20	4	225	

Listings of Selected Data Files

```
C  FILENAME= H910A001.J_1
C
C  H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C  D090894
C  12 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
4.70  1.50  45.245  2.211  1.354  13.526  10.069  7.087  10.490  .153 -2.223
4.49  1.50  63.038  2.455  .395  17.458  11.805  6.816  47.540 -1.563 -7.021
4.30  1.50  80.244  2.179  -.096  17.541  12.350  6.816  47.120 -1.605 -9.640
4.00  1.50  96.715  .840  .176  13.925  9.812  7.254  51.473 -1.320 -2.454
3.51  1.50  106.534  .814  .197  11.118  8.132  7.339  38.856  .604 -2.605
3.01  1.50  113.880  .744  .203  9.677  7.320  7.056  30.055  1.084  .930
2.51  1.50  119.246  .475  .195  8.805  6.710  6.718  25.411 -1.126 -1.752
2.00  1.50  123.636  .288  .172  8.134  6.318  6.102  21.539  -.772 -3.260
1.51  1.50  127.633  .379  .039  7.359  5.757  5.532  13.717  .366  -.917
1.01  1.50  130.283  .008  .051  6.719  5.313  5.073  11.360  -.199 -1.974
.51  1.50  132.161  .143  .020  6.045  4.968  4.742  4.832  .979  -.639
.00  1.50  132.947  .003  .004  5.843  4.906  4.395  .599  .092  -.288
```

```
C  FILENAME= H910A010.J_1
C
C  H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C  D090894
C  10 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
5.50  10.00  47.798  7.061  1.981  13.384  10.200  11.936  89.749 -2.888 -2.301
5.00  10.00  60.681  6.716  1.777  15.929  11.585  13.037  110.695  -.502  .647
4.51  10.00  75.968  5.069  2.037  17.337  12.785  12.997  114.151 -4.634 -11.047
4.01  10.00  92.260  1.501  1.403  16.730  12.002  12.086  93.429 -2.484 -4.355
3.41  10.00  106.451  -.638  1.210  13.453  9.703  9.706  57.647 -1.097 -1.549
2.70  9.99  116.605  -.472  .488  10.257  7.556  7.464  28.801  -.119 -3.538
2.01  10.00  123.160  -.297  .452  8.545  6.103  6.080  18.917  .311 -2.087
1.30  10.00  128.239  -.322  .185  7.181  5.350  5.233  12.029  -.885 -1.406
.62  10.00  130.866  -.201  .058  6.537  5.090  4.765  5.680  .235  -.158
.01  10.00  131.208  -.302  .101  6.306  5.018  4.615  -.323  .353  -.729
```

```
C  FILENAME= H910A025.J_1
C
C  H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C  D090894
C  12 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
7.00  25.00  40.000  4.442  .548  10.343  7.167  8.780  43.624  .584  2.826
6.01  25.00  51.245  4.184  1.351  12.630  9.113  11.048  67.799  .045  3.467
5.51  25.00  59.076  4.699  1.655  14.016  10.557  12.120  87.083 -3.623 -1.355
5.01  25.00  66.806  4.388  2.069  15.379  11.444  12.835  101.362  .984  -.644
4.50  25.00  76.153  4.399  2.178  17.038  12.361  13.440  111.294 -5.517 -7.605
4.01  25.00  86.412  3.276  1.641  17.457  12.691  13.049  111.088  1.904 -3.777
3.41  25.00  98.616  1.749  1.300  16.298  11.842  11.973  92.842  -.232 -6.712
2.70  25.00  111.837  1.002  1.176  14.283  10.365  10.106  70.032  1.265 -4.581
2.01  25.00  121.454  -.143  .403  10.964  8.316  8.146  34.493  .419 -3.889
1.29  25.00  127.682  -.291  .268  8.669  6.679  6.466  16.780  .420  -.481
.62  25.00  130.651  -.157  .376  7.772  5.805  5.487  7.021  .140 -1.086
.01  25.00  131.472  -.229  -.049  7.129  5.582  5.218  -.233  1.606 -1.668
```

```
C  FILENAME= H910A050.J_1
C
C  H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C  D090894
C  11 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
8.80  49.99  35.764  3.672  .642  8.774  5.877  7.484  27.519  .917 -1.676
8.22  49.99  40.069  3.675  .644  9.489  6.538  8.318  32.578  .866  1.620
7.01  49.99  49.646  3.749  .759  11.372  8.137  10.209  50.565 -1.965 -1.294
```


6.00	49.99	57.945	3.504	1.738	13.140	9.482	11.903	67.875	-2.190	-.967
5.01	49.99	67.518	3.189	1.531	15.356	11.025	12.605	90.926	-1.579	-7.205
4.00	49.99	79.731	2.831	1.696	16.747	11.750	12.902	99.144	1.587	-5.555
2.72	49.99	97.285	1.985	1.235	16.185	11.578	11.828	84.821	2.192	-7.972
2.00	49.99	106.157	.929	.935	15.758	11.535	11.014	79.219	-.367	-9.674
1.30	49.99	113.972	.405	.589	14.018	10.367	9.708	46.716	1.479	-8.504
.60	49.99	119.552	.511	.331	11.742	9.734	8.746	17.026	1.492	-6.419
.00	49.99	120.325	-.367	.511	11.439	9.462	8.816	-4.297	.136	-4.541

C FILENAME= H910A075.J_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
11.00	75.00	33.019	3.721	.110	8.148	4.949	7.151	21.340	1.071	-.669	
9.49	75.00	40.316	3.475	.546	8.839	6.065	8.634	25.152	.569	.101	
8.23	75.00	47.728	3.742	.499	10.271	7.447	9.660	37.627	.411	-.873	
7.01	75.00	54.961	3.849	1.207	11.694	8.535	10.839	49.695	1.922	.478	
5.99	75.00	60.155	3.343	1.202	12.798	9.693	11.411	63.522	-1.228	-6.162	
5.00	75.00	68.076	3.083	1.223	13.815	10.532	11.809	68.806	-2.526	-8.012	
3.99	75.00	75.808	2.899	1.430	14.925	11.181	12.060	74.422	2.027	-5.927	
2.72	75.00	87.425	1.793	1.160	15.575	11.293	11.613	66.776	-.755	-7.665	
2.00	75.00	93.184	1.393	1.240	14.995	11.540	10.996	55.989	5.786	-8.213	
1.30	75.00	97.597	1.059	.970	14.566	11.448	10.493	33.976	.838	-3.772	
.61	75.00	100.550	.399	.991	13.889	11.213	10.119	13.381	1.639	-8.131	
.00	75.00	100.847	.110	.784	13.714	11.004	10.073	-4.609	3.454	-9.884	

C FILENAME= H910A150.J_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 15 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
16.00	150.00	32.543	3.628	.375	7.119	4.563	6.875	14.028	-.479	.519	
13.99	150.00	36.672	4.016	.237	7.889	5.235	7.556	17.348	.395	1.720	
11.99	150.00	40.661	3.640	.259	8.526	5.836	7.958	23.405	1.151	1.320	
10.00	150.00	45.669	3.288	.876	8.844	6.268	8.111	23.247	.715	-2.045	
9.00	150.00	47.279	3.080	.192	9.249	6.676	8.427	27.511	-.012	-1.994	
8.01	150.00	50.193	3.072	.416	9.224	6.724	8.501	27.153	.933	.124	
7.01	150.00	52.207	2.705	.302	9.856	7.003	8.523	29.648	1.327	-.744	
5.99	150.00	54.615	2.273	.132	9.749	7.178	8.550	25.921	3.413	-2.951	
5.00	150.00	56.927	1.819	.503	10.216	7.325	8.210	26.735	3.495	-1.077	
3.99	150.00	59.859	1.612	.490	9.411	7.212	8.227	19.625	-.953	-3.899	
3.00	150.00	61.912	1.469	.411	9.457	7.223	8.020	18.576	-.170	-6.716	
2.01	150.00	63.611	.966	.234	9.647	7.415	7.639	10.186	1.037	-4.116	
1.01	150.00	64.592	.435	.660	9.573	7.286	7.784	5.116	2.119	-5.857	
.51	150.00	65.262	.157	.301	9.209	7.265	7.597	2.818	-.190	-3.387	
.00	150.00	64.906	-.029	.311	9.579	7.443	7.717	.603	.391	-5.104	

C FILENAME= H910A225.J_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 13 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
24.00	225.00	26.731	3.348	.200	5.428	3.576	5.630	8.537	.275	.671	
21.99	224.99	28.699	3.500	.252	5.915	3.896	5.915	10.124	.400	.630	
20.00	224.99	30.875	3.500	.060	6.131	4.274	6.285	10.947	.225	-1.317	
18.00	224.99	32.601	3.266	.198	6.734	4.421	6.123	12.208	.169	.654	
15.99	224.99	35.026	3.167	-.034	6.877	4.606	6.325	12.465	1.387	.480	
13.99	224.99	37.397	2.925	-.250	6.950	4.645	6.372	11.581	.926	-.615	
11.99	224.99	40.639	2.459	-.054	7.570	5.470	7.293	15.476	-.862	-.386	
10.00	224.99	43.182	2.619	-.035	6.908	4.983	6.149	11.437	.231	-1.101	
8.00	224.99	45.480	2.312	-.037	6.865	5.184	6.277	11.443	.578	-1.480	
5.99	224.99	46.637	1.601	-.228	7.002	5.207	6.178	9.452	1.569	-1.753	
3.98	224.99	48.849	1.329	-.153	6.813	5.150	6.019	6.286	-.072	-1.666	
2.00	224.99	49.905	.623	.090	6.725	5.239	5.827	3.885	.115	-2.420	

.01 224.99 50.004 -.084 -.153 6.906 5.086 5.658 .566 .129 -1.440

C FILENAME= H910A001.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
13.50	1.50	13.952	1.614	.659	3.432	2.886	2.678	4.899	.161	-.187	
13.00	1.50	17.695	.577	.520	2.961	2.109	2.268	2.660	.182	-.148	
12.49	1.50	19.672	.193	.528	2.427	1.631	1.879	1.406	.143	-.125	
12.00	1.50	21.022	.127	.577	2.146	1.372	1.639	1.048	.071	-.275	
11.19	1.50	22.600	.149	.664	1.766	1.194	1.432	.660	.038	-.107	
10.40	1.50	23.346	.088	.589	1.474	1.059	1.255	.304	-.034	-.181	
9.60	1.50	23.493	.071	.478	1.326	.997	1.186	-.084	-.056	-.137	
8.20	1.50	22.706	-.058	.295	1.586	1.097	1.319	-.587	-.057	-.135	
6.99	1.49	20.177	-.265	.099	2.184	1.338	1.663	-1.358	-.025	-.168	
6.01	1.50	15.249	-.697	-.037	3.190	1.375	1.742	-1.934	.000	-.178	
5.51	1.50	7.597	-2.581	-.082	2.005	1.066	1.417	-.617	-.004	.045	

C FILENAME= H910A010.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
14.00	9.99	13.351	1.997	.496	3.344	2.974	3.017	4.734	.667	-.238	
13.00	9.99	18.506	1.459	.631	2.862	2.300	2.521	3.031	.242	-.209	
12.01	9.99	21.561	1.098	.627	2.122	1.611	1.737	1.212	.056	-.150	
11.00	9.99	23.305	1.135	.630	1.613	1.275	1.292	.434	-.018	-.078	
10.00	9.99	23.670	1.311	.450	1.377	1.117	1.148	-.094	-.013	-.137	
9.01	9.99	23.126	1.390	.309	1.524	1.147	1.244	-.594	-.060	-.100	
8.01	10.00	21.569	1.459	.142	2.064	1.320	1.491	-1.318	.006	-.087	
7.01	10.00	19.811	1.122	.030	1.939	1.375	1.545	-1.051	-.017	-.069	
6.01	10.00	21.503	-1.064	.044	2.792	1.931	1.850	1.461	.087	.026	

C FILENAME= H910A025.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
15.99	25.00	10.061	1.296	.656	3.007	2.942	3.108	3.792	.006	-.409	
15.01	25.00	13.384	1.372	.981	3.334	3.141	3.537	5.037	.580	-.146	
13.98	25.00	18.096	1.997	.641	3.105	2.692	2.698	4.159	.219	.262	
13.01	25.00	20.982	1.823	.613	2.544	2.331	2.227	2.919	.147	-.041	
12.01	25.00	23.131	1.681	.578	1.836	1.884	1.647	1.133	.011	.000	
11.01	25.00	23.785	1.596	.419	1.598	1.610	1.227	.053	-.063	.009	
10.01	25.00	23.147	1.597	.322	1.745	1.474	1.220	-.762	-.055	.045	
9.00	25.00	22.443	1.329	.224	1.599	1.175	1.178	-.451	-.011	-.036	
8.00	25.00	22.650	.785	.139	1.463	1.059	1.177	.139	-.008	.024	
7.00	25.00	25.162	-.695	.386	3.414	2.664	2.441	2.573	.099	.357	

C FILENAME= H910A050.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
22.00	50.01	5.461	1.180	.539	2.244	3.034	3.125	1.584	.023	-.563	
20.00	50.01	8.297	1.858	.335	2.989	3.616	2.814	3.995	.348	-.460	
18.00	50.01	12.497	2.452	.507	3.382	3.706	3.057	5.864	.208	.072	
15.99	50.01	17.027	2.399	.633	3.335	3.424	2.813	5.571	-.026	-.372	
15.01	50.01	18.896	2.125	.630	3.048	3.300	2.732	5.046	-.146	-.267	
14.00	50.01	20.752	2.017	.450	2.711	2.946	2.254	3.460	-.107	-.112	
13.01	50.01	21.779	1.571	.513	2.367	2.631	1.888	2.228	-.364	-.065	
12.00	50.01	22.417	1.212	.401	2.064	2.305	1.541	1.151	.037	.032	

11.01	50.01	22.970	.760	.326	1.865	1.915	1.342	.866	-.045	.132
10.01	50.01	23.242	.159	.304	1.951	1.681	1.250	1.024	.027	.058
9.00	50.01	24.023	-.606	.410	3.002	2.029	1.901	1.555	-.012	.097

C FILENAME= H910A075.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 17 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	75.00	7.384	3.027	.058	2.979	4.200	2.627	4.247	-.242	.362	
24.00	75.00	9.111	2.948	.198	3.197	4.127	2.707	5.259	.304	.254	
22.00	75.00	11.363	2.779	.386	3.360	3.944	2.868	5.680	-.296	.135	
21.00	75.00	12.849	2.941	.332	3.487	3.813	2.844	5.684	-.183	.335	
20.00	75.00	13.516	2.452	.484	3.429	3.787	2.814	5.763	-.295	-.454	
18.00	75.00	16.597	2.490	.438	3.268	3.578	2.629	4.870	-.221	.120	
16.00	75.00	18.848	1.920	.536	3.007	3.138	2.435	3.793	-.134	.004	
13.99	75.00	20.661	1.213	.540	2.817	2.763	2.240	3.214	-.060	.057	
12.00	75.00	22.061	.323	.337	3.043	2.370	2.068	2.914	.005	.323	
11.01	75.00	22.855	.240	.378	4.295	2.775	2.758	3.863	.265	.507	
10.01	75.00	24.483	-.380	.464	4.788	2.770	3.218	4.953	.516	.679	
8.99	75.00	28.676	-.669	.852	7.402	4.117	4.754	13.723	1.988	2.477	
7.99	75.00	36.455	.335	.977	10.813	6.120	7.304	35.643	3.393	2.568	
5.99	75.00	53.416	1.034	2.221	13.499	8.748	10.353	61.412	7.484	-1.058	
5.01	75.00	60.641	.793	2.470	14.266	9.395	11.258	68.798	5.766	-5.666	
3.99	75.00	68.597	.163	2.831	15.261	9.964	11.271	76.509	6.879	-5.052	
3.01	75.00	77.011	-.237	3.348	15.518	10.168	11.598	71.354	7.696	-8.987	

C FILENAME= H910A150.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	150.00	13.188	1.355	.369	2.617	2.541	2.326	2.842	-.183	.135	
24.00	150.00	14.244	1.266	.395	2.682	2.518	2.314	2.945	-.057	.013	
22.00	150.00	15.443	1.136	.465	2.760	2.369	2.285	3.002	-.062	.026	
20.00	150.00	16.266	.880	.567	2.890	2.313	2.296	3.046	-.093	.269	
18.00	150.00	17.265	.644	.405	3.169	2.240	2.438	2.923	.001	.243	
16.00	150.00	18.813	.442	.476	3.699	2.258	2.760	3.345	.321	.204	
13.99	150.00	20.606	.077	.637	4.895	2.598	3.516	4.734	.460	.469	
12.00	150.00	26.384	.453	.972	8.880	4.303	5.138	19.307	1.576	3.483	
10.01	150.00	34.935	1.042	1.413	10.815	6.055	7.369	29.543	4.504	1.267	
8.00	150.00	43.767	1.632	1.281	11.461	6.989	8.054	36.205	4.424	.511	
6.00	150.00	50.078	.761	1.876	11.481	7.318	8.397	34.272	3.677	-1.099	
3.99	150.00	56.517	.456	1.920	11.402	7.713	8.120	30.486	4.130	-4.255	
2.00	150.00	62.010	.561	2.126	10.567	7.794	7.664	15.784	3.144	-7.148	
.00	150.00	64.458	-.241	2.260	9.980	7.621	7.656	-.326	-.021	-10.113	

C FILENAME= H910A225.A_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	224.99	13.859	.643	.306	2.756	1.929	2.454	2.235	-.114	.010	
23.99	224.99	14.085	.294	.631	2.672	1.825	2.571	2.086	-.058	-.296	
21.99	224.99	14.875	.108	.557	2.759	1.796	2.410	2.123	.289	-.041	
20.00	224.99	16.546	.039	.493	3.350	1.929	2.741	2.240	.384	.439	
18.00	224.99	18.138	.010	.573	4.532	2.252	3.095	3.777	.516	.648	
15.99	224.99	20.981	.220	.775	7.050	3.288	3.985	12.176	.830	1.064	
13.99	224.99	27.766	1.428	.617	8.757	4.748	5.439	19.554	.793	-1.811	
11.99	224.99	33.291	2.023	.801	8.879	5.418	6.434	19.446	3.000	.286	
9.99	224.99	36.387	1.545	1.057	9.131	5.596	6.431	20.540	2.606	-1.417	
7.99	224.99	40.532	1.437	1.057	9.160	5.728	6.362	18.467	3.471	-1.287	
5.99	224.99	43.072	1.100	1.001	8.722	5.727	6.376	13.724	3.019	-2.843	
3.98	224.99	46.149	.752	1.044	8.423	5.810	6.213	9.809	.323	-2.927	
2.00	224.99	47.194	.255	1.354	8.497	5.876	5.942	7.068	1.973	-4.286	

.00 224.99 48.258 -.130 1.318 8.323 5.928 5.928 -.618 1.528 -4.175

C FILENAME= H910A001.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	1.50	4.138	-.225	.182	.267	.200	.363	.011	.002	.007
	24.00	1.50	4.164	-.273	.183	.280	.217	.386	.009	.006	.011
	22.00	1.50	4.168	-.328	.206	.275	.203	.384	.000	.003	.019
	20.00	1.50	4.109	-.420	.215	.310	.207	.377	-.008	.001	.017
	18.00	1.50	3.916	-.527	.176	.354	.228	.377	-.015	.003	.008
	16.00	1.50	3.522	-.631	.135	.518	.333	.404	-.028	.007	-.002
	15.00	1.50	3.316	-.667	.110	.755	.707	.564	-.023	.009	-.005
	14.00	1.50	5.913	-.761	.166	2.376	2.349	2.058	2.684	.195	-.110

C FILENAME= H910A010.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	9.99	4.057	-.191	.185	.268	.202	.365	.012	.001	.009
	24.00	10.01	4.080	-.223	.186	.276	.200	.376	.007	.003	.014
	22.00	10.00	4.070	-.245	.204	.284	.211	.361	.006	.003	.014
	20.00	10.01	3.974	-.279	.180	.306	.240	.402	-.002	.001	.019
	18.00	10.01	3.884	-.327	.183	.427	.354	.408	-.007	.006	.015
	15.99	10.01	3.881	-.400	.072	.932	1.022	.809	.079	.054	-.070
	15.00	10.01	6.767	-.058	.182	2.452	2.218	2.032	2.713	.220	-.066
	14.00	10.01	12.051	.058	.194	3.435	2.926	2.981	5.324	.514	-.284
	13.02	9.99	17.365	-.423	-.059	3.287	2.739	2.927	4.405	.381	-.759

C FILENAME= H910A025.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	25.00	4.005	-.140	.175	.269	.208	.351	.011	.001	.008
	24.00	25.00	4.018	-.152	.183	.293	.235	.368	.008	.004	.012
	22.00	25.00	4.037	-.189	.174	.365	.321	.414	.003	-.001	.019
	20.00	25.00	4.030	-.210	.156	.497	.474	.452	.004	-.004	.008
	18.00	25.00	4.516	-.243	.126	.920	1.050	.822	.128	.008	-.016
	16.00	25.00	9.378	.158	.265	2.989	2.417	2.409	3.424	.278	-.367
	13.99	25.00	16.563	-.014	.334	3.326	2.804	2.883	4.763	.478	-.388
	12.00	25.00	21.931	-.588	.358	2.898	2.487	2.332	3.512	-.114	-.702

C FILENAME= H910A050.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	50.01	4.014	-.166	.173	.495	.521	.362	.009	-.002	.008
	24.00	50.01	4.184	-.148	.159	.658	.790	.432	.040	-.021	.020
	22.00	50.01	4.563	-.210	.166	.954	1.222	.699	.076	-.037	-.016
	20.00	50.01	6.542	-.136	.148	2.102	2.057	1.634	1.450	-.019	-.340
	18.00	50.01	10.668	.035	.281	3.294	2.810	2.528	4.435	.455	-.328
	16.00	50.01	15.573	-.041	.317	3.466	3.162	2.867	6.076	.281	-.349
	13.99	50.01	19.151	-.557	.491	3.336	3.112	2.617	5.591	.280	-.767
	12.00	50.01	21.461	-1.138	.403	2.998	2.760	2.199	3.911	-.257	-.651

C FILENAME= H910A075.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

```

C D090894
C 9 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
26.00 75.00 5.194 -.098 .177 1.307 1.620 .854 .418 -.125 -.024
24.00 75.00 6.701 .086 .109 2.150 2.184 1.564 1.742 .040 -.187
22.00 75.00 9.055 .162 .174 2.921 2.705 2.121 3.838 -.008 -.340
20.00 75.00 11.928 .059 .352 3.285 3.161 2.446 5.536 .162 .197
18.00 75.00 14.922 .024 .365 3.493 3.164 2.591 6.028 .136 -.068
15.99 75.00 17.368 -.057 .387 3.402 3.163 2.472 5.601 -.276 -.378
13.98 75.00 19.431 -.658 .434 3.300 2.825 2.380 4.550 -.150 -.544
11.99 75.00 20.703 -1.043 .356 3.466 2.511 2.162 3.736 -.197 -.459
10.01 75.00 22.745 -1.801 .450 4.035 2.347 2.662 3.753 .345 -.174

```

C FILENAME= H910A150.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

```

C 9 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
26.00 150.00 12.845 .923 .453 2.789 2.340 2.095 3.212 -.155 -.329
24.00 150.00 13.699 .707 .621 2.903 2.329 2.040 3.363 .033 -.350
21.99 150.00 15.031 .708 .553 2.821 2.236 2.069 3.232 -.171 -.310
20.00 150.00 15.774 .482 .600 3.021 2.265 2.155 3.214 .197 -.268
18.00 150.00 16.715 .120 .620 3.110 2.048 2.223 2.857 .198 -.198
15.99 150.00 17.843 -.150 .759 3.353 2.035 2.436 2.610 .332 -.249
13.99 150.00 19.280 -.640 .814 4.053 2.192 2.859 2.895 .575 -.214
11.99 150.00 22.967 -1.142 .958 6.779 3.018 4.267 5.932 2.001 1.061
10.00 150.00 30.751 -1.102 .971 11.799 4.961 6.557 22.973 2.529 -1.235

```

C FILENAME= H910A225.E_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

```

C 8 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
24.00 224.99 14.751 .363 .701 2.699 1.762 2.105 1.993 .193 -.227
22.00 224.99 15.446 .136 .761 2.893 1.815 2.252 1.917 .312 -.362
20.00 224.99 16.355 -.121 .734 3.255 1.892 2.519 1.932 .647 -.298
18.00 224.99 17.343 -.407 .970 3.747 2.097 2.755 2.065 .926 .058
16.00 224.99 19.461 -.663 .836 5.412 2.478 3.426 3.677 1.383 -.691
13.98 224.99 26.148 -.188 .883 9.087 4.516 5.373 17.095 2.148 -1.517
11.99 224.99 28.479 -.364 .971 10.307 4.875 5.436 21.305 1.763 -5.351
10.00 224.99 34.217 -.232 .944 10.652 5.866 6.676 26.045 4.184 -5.463

```

C FILENAME= H910AAX.J_1

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

```

C 15 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
.00 1.50 131.512 .000 .001 5.862 4.915 4.512 1.286 -.468 -.745
.00 9.99 130.673 -.100 -.020 6.099 5.139 4.679 1.325 1.608 -.457
.00 20.00 131.064 -.149 .163 7.035 5.487 4.950 1.540 .985 -2.055
.00 30.00 128.996 .004 .108 7.831 6.396 5.788 .227 1.258 -2.861
.00 40.01 126.374 -.013 .296 9.131 7.820 7.263 1.248 .055 -3.821
.00 50.01 120.103 .022 .188 11.510 9.643 8.915 1.325 1.872 -7.895
.00 60.01 112.032 .224 .436 13.760 10.941 9.740 -2.350 4.954 -15.811
.00 70.00 102.820 .122 .478 14.161 11.604 10.167 -5.010 1.854 -16.516
.00 80.00 95.617 .220 .237 13.727 10.920 9.830 -3.495 2.634 -14.290
.00 90.00 88.453 .559 .681 12.971 10.467 9.936 -6.182 3.347 -15.853
.00 100.00 83.341 .354 .518 12.178 9.957 9.457 -.633 .314 -12.619
.00 110.00 78.419 .072 .579 11.143 9.197 8.797 .886 -.264 -10.265
.00 120.00 74.499 .093 .421 10.948 8.689 8.487 -1.518 .552 -10.724
.00 130.00 70.498 .244 .309 10.133 8.112 8.023 .996 .378 -7.248
.00 140.01 67.579 .429 .155 9.426 7.546 7.736 -.470 .004 -5.501
.00 150.00 64.617 .257 .146 9.153 7.232 7.426 .571 .052 -4.828
.00 160.01 62.182 .075 .155 8.870 6.803 6.977 .614 .573 -5.556
.00 170.00 59.249 .134 .254 8.125 6.563 6.738 1.174 .022 -6.182

```

.00	180.00	57.779	.207	-.033	7.806	6.187	6.568	.963	.401	-4.973
.00	190.01	55.479	.093	-.254	7.857	6.103	6.401	-.007	.982	-2.481
.00	200.00	53.964	.206	-.082	7.415	5.544	6.109	.836	-.203	-4.028
.00	225.01	48.959	.017	-.232	6.703	5.224	5.713	1.010	.456	-4.756

C FILENAME= H910A001.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	4.70	1.50	1562.036	-382.566	50.087	245.489	833.072	-29.863	29.152	49.309	-19.634
	4.49	1.50	2437.059	381.794	71.065	265.304	333.434	-38.068	30.652	3.701	-63.160
	4.30	1.50	-642.317	-92.079	50.865	-112.384	-470.196	52.704	.412	-15.351	63.083
	4.00	1.50	-945.043	-233.448	4.738	-306.442	-476.785	3.467	13.224	25.254	-6.228
	3.51	1.50	-410.518	-135.516	-11.838	-207.688	-199.746	7.477	3.741	-36.892	38.152
	3.01	1.50	-286.334	-66.701	-25.396	-150.274	-120.081	15.252	9.293	-25.985	-5.937
	2.51	1.50	-229.818	-85.377	-2.106	-126.313	-123.771	4.527	2.108	-25.897	15.329
	2.00	1.50	-231.383	-69.088	6.301	-116.971	-106.533	12.430	-5.525	-29.304	-14.275
	1.51	1.50	-168.110	-39.530	10.965	-82.035	-91.560	3.778	-6.788	-17.136	11.108
	1.01	1.50	-140.013	-29.633	7.722	-57.436	-68.811	3.093	-1.445	-21.908	9.129
	.51	1.50	-89.287	-2.172	.450	-30.021	-52.971	3.442	-2.930	-15.439	2.688
	.00	1.50	-78.508	-1.078	5.151	4.033	-55.670	3.096	2.482	-12.272	-1.265

C FILENAME= H910A010.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	5.50	10.00	1628.901	622.678	134.321	927.474	782.019	-35.092	107.965	138.361	-48.609
	5.00	10.00	1884.693	543.053	138.645	717.447	636.102	5.459	151.495	156.292	50.796
	4.51	10.00	736.676	216.092	27.694	35.173	105.835	-48.765	58.425	69.308	-63.859
	4.01	10.00	-1052.929	-308.546	32.980	-613.052	-484.723	57.862	.444	-161.183	88.925
	3.41	10.00	-1153.586	-370.605	-18.407	-576.754	-453.430	-4.426	-50.519	-63.276	9.999
	2.70	9.99	-369.418	-158.914	-1.988	-179.257	-150.112	24.199	-27.839	-34.101	28.288
	2.01	10.00	-245.885	-60.805	3.913	-114.534	-83.993	4.720	-2.926	-25.920	15.248
	1.30	10.00	-155.232	-47.499	9.018	-69.181	-70.791	6.718	-8.043	-20.201	4.518
	.62	10.00	-137.494	-19.169	-11.707	-40.983	-59.452	-.666	2.284	-16.251	12.703
	.01	10.00	-92.551	-6.741	13.853	1.461	-61.079	5.134	-2.807	-8.854	6.630

C FILENAME= H910A025.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	7.00	25.00	829.139	268.345	68.860	413.198	363.521	26.013	117.589	229.569	-17.412
	6.01	25.00	1386.980	427.715	77.129	615.419	560.900	-5.456	118.938	181.441	9.312
	5.51	25.00	1507.366	523.400	8.018	754.207	664.117	21.976	83.152	181.815	-23.634
	5.01	25.00	1607.587	479.055	-142.991	667.429	622.570	-45.080	146.553	124.339	-151.453
	4.50	25.00	1211.457	246.965	26.761	323.925	336.570	27.604	51.902	-7.717	37.545
	4.01	25.00	-263.515	5.718	-128.188	-226.056	-163.980	-25.763	-77.398	-221.657	5.243
	3.41	25.00	-1180.836	-242.840	-135.294	-644.693	-580.470	36.908	-17.224	-142.556	-20.790
	2.70	25.00	-1812.605	-525.707	23.277	-856.518	-700.881	19.852	28.977	-137.165	17.710
	2.01	25.00	-721.307	-258.486	-14.955	-303.576	-304.230	41.419	-32.670	-77.626	34.024
	1.29	25.00	-244.235	-117.180	2.449	-131.384	-134.855	-13.735	-19.483	-23.200	-8.653
	.62	25.00	-120.980	-44.730	14.749	-44.750	-80.036	4.023	-5.282	-15.735	1.806
	.01	25.00	-81.419	-2.124	6.030	4.003	-56.919	1.700	-.154	-17.931	8.388

C FILENAME= H910A050.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	8.80	49.99	466.255	136.088	37.100	194.729	179.374	2.402	44.291	134.218	-20.876

8.22	49.99	456.533	169.355	58.912	241.002	222.303	22.540	56.344	135.537	8.450
7.01	49.99	833.647	249.858	8.604	375.224	327.119	-24.243	127.320	182.563	-27.584
6.00	49.99	1235.980	405.349	-101.261	562.325	519.095	8.078	110.716	210.989	-53.178
5.01	49.99	1659.615	496.288	-84.271	632.151	616.590	43.380	116.778	48.729	-113.415
4.00	49.99	778.382	209.363	-237.581	222.756	194.256	-14.063	85.042	-95.282	-96.964
2.72	49.99	-1202.364	-278.238	5.084	-552.570	-481.321	-34.290	-12.726	-263.861	79.312
2.00	49.99	-1707.252	-418.185	-10.981	-757.963	-729.538	41.395	-47.972	-393.221	42.242
1.30	49.99	-1960.485	-255.059	30.201	-683.661	-775.475	66.513	-40.300	-294.940	82.635
.60	49.99	-1223.460	-151.798	36.132	-258.810	-618.087	61.448	-10.199	-146.456	55.876
.00	49.99	-1087.148	28.435	9.674	110.823	-580.952	11.205	-22.326	-218.811	35.876

C FILENAME= H910A075.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
11.00	75.00	351.077	81.373	-3.386	127.082	117.636	-5.829	47.466	129.293	-9.410	
9.49	75.00	357.516	119.672	17.079	169.400	171.885	12.979	47.279	115.396	-34.371	
8.23	75.00	444.495	199.563	-14.902	239.037	242.680	-.035	92.002	136.433	-2.801	
7.01	75.00	849.833	278.370	10.607	377.976	345.766	21.623	68.222	62.182	-34.363	
5.99	75.00	1068.688	364.761	-89.555	441.560	453.568	4.984	120.430	86.940	-107.747	
5.00	75.00	857.188	337.500	21.326	320.210	378.324	-27.151	91.160	-8.857	-126.833	
3.99	75.00	656.792	236.892	-240.132	162.667	194.019	-17.016	110.329	35.735	-103.193	
2.72	75.00	-96.111	118.330	-169.995	-140.028	-96.066	-5.739	12.898	-185.387	48.807	
2.00	75.00	-417.963	-150.258	-127.887	-300.325	-421.355	13.946	16.266	-178.949	-55.781	
1.30	75.00	-793.852	-98.504	-29.836	-275.895	-498.250	-75.794	-2.111	-186.231	50.128	
.61	75.00	-738.124	-17.550	-46.159	-142.388	-488.847	33.365	-16.025	-117.758	108.125	
.00	75.00	-736.543	-6.256	-5.594	102.609	-532.337	43.564	5.272	-185.678	66.883	

C FILENAME= H910A150.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 15 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
16.00	150.00	176.555	40.168	16.919	47.265	72.829	1.841	19.679	68.415	-4.401	
13.99	150.00	147.179	55.646	-15.253	45.558	70.859	.689	38.283	71.176	9.025	
11.99	150.00	156.735	57.844	75.617	88.451	86.198	10.507	54.390	61.585	-7.867	
10.00	150.00	128.487	69.212	-14.046	84.020	100.775	-10.504	32.138	23.611	-8.276	
9.00	150.00	185.200	78.924	-13.905	91.190	96.403	-6.614	42.950	31.114	-10.953	
8.01	150.00	160.377	75.197	1.314	65.224	82.230	-4.469	40.777	-4.670	-31.476	
7.01	150.00	166.506	80.946	-16.080	70.561	96.569	-10.024	19.465	-25.967	-14.230	
5.99	150.00	72.178	45.256	15.107	9.241	44.767	-3.088	12.081	-35.209	9.289	
5.00	150.00	-11.005	24.761	-30.844	-38.578	21.582	-2.356	-.076	-71.407	-3.732	
3.99	150.00	37.112	5.632	-.834	-23.388	19.143	-7.976	-12.553	-40.368	15.244	
3.00	150.00	-29.489	13.553	12.117	-46.315	-6.719	-8.348	-16.073	-54.427	2.712	
2.01	150.00	-25.123	-12.986	13.298	-43.363	-10.249	-15.657	-3.760	-67.558	19.394	
1.01	150.00	-23.057	1.690	-17.297	-34.052	-45.706	8.879	8.063	-65.288	-6.989	
.51	150.00	-31.389	-2.781	4.108	-18.373	-54.384	-5.547	-12.615	-58.013	18.273	
.00	150.00	-170.792	-17.533	9.560	-12.355	-35.326	9.382	-8.847	-69.756	8.618	

C FILENAME= H910A225.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 13 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
24.00	225.00	68.766	15.188	19.442	19.195	27.957	-1.001	-1.691	25.546	-3.330	
21.99	224.99	84.776	18.335	-5.061	27.797	35.605	5.759	7.527	29.779	-4.377	
20.00	224.99	80.578	23.507	-9.003	22.509	40.002	5.552	11.449	29.565	-17.184	
18.00	224.99	129.026	25.468	3.306	38.535	42.537	-1.481	9.702	23.145	6.427	
15.99	224.99	99.259	29.280	-11.734	22.955	34.178	-1.376	11.350	27.096	-4.537	
13.99	224.99	28.924	25.387	-.011	20.756	33.624	-2.393	13.665	10.780	-4.073	
11.99	224.99	110.227	41.725	-35.198	46.378	54.909	-6.874	14.451	12.731	15.161	
10.00	224.99	-1.512	15.017	.033	-1.737	15.423	1.935	5.208	-10.260	-2.752	
8.00	224.99	-3.664	15.361	-12.087	-3.881	6.015	-4.940	2.586	-14.696	-4.459	
5.99	224.99	-21.806	15.942	-4.566	-16.928	.859	.872	2.871	-18.660	6.156	

3.98	224.99	-44.285	-2.668	12.905	-10.967	2.028	-2.616	-6.873	-24.804	5.811
2.00	224.99	-30.515	-2.023	-7.264	-.283	-3.836	2.410	-4.164	-17.802	15.406
.01	224.99	-1.164	6.772	9.005	.283	-7.339	-2.724	2.750	-18.681	6.797

C FILENAME= H910A001.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
13.50	1.50	-10.120	-9.827	1.477	-9.625	-8.605	1.131	-1.446	-1.339	-.888	
13.00	1.50	-9.595	-4.839	-.856	-5.433	-4.586	.077	-1.623	-1.002	-.970	
12.49	1.50	-4.456	-1.178	.013	-1.854	-1.404	-.146	-.735	-.462	-.535	
12.00	1.50	-2.474	-.730	.390	-1.283	-.952	-.091	-.334	-.367	-.137	
11.19	1.50	-1.390	-.333	.233	-.871	-.559	.011	-.079	-.125	-.153	
10.40	1.50	-.496	-.219	.096	-.450	-.265	.019	-.046	.028	-.006	
9.60	1.50	-.230	.065	-.054	.012	-.245	-.058	.011	.044	-.079	
8.20	1.50	-.873	.424	.032	.578	-.452	.019	.232	-.192	-.146	
6.99	1.49	-4.175	1.129	-.052	2.044	-1.213	.091	.320	-.681	.025	
6.01	1.50	-4.833	-.215	.255	.947	-.147	.175	.043	.296	-.197	
5.51	1.50	3.104	-.017	.267	-.951	.192	-.017	-.040	.304	.103	

C FILENAME= H910A010.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
14.00	9.99	1.389	-7.563	-1.638	-2.738	-3.528	-.440	-1.588	1.114	-1.042	
13.00	9.99	-8.091	-6.965	-1.018	-6.090	-5.153	.201	-3.376	-2.023	-1.101	
12.01	9.99	-2.832	-2.010	.005	-1.853	-1.475	-.126	-1.223	-.587	-.268	
11.00	9.99	-.810	-.473	.118	-.630	-.571	-.059	-.254	-.155	.037	
10.00	9.99	-.125	.168	-.002	-.018	-.394	-.051	.019	-.015	-.078	
9.01	9.99	-1.419	.602	.056	.794	-.601	.039	.280	-.339	-.081	
8.01	10.00	-3.595	.856	-.051	1.747	-1.115	-.077	.500	-.758	-.279	
7.01	10.00	1.177	.720	.392	-.470	.098	.090	.192	.008	-.021	
6.01	10.00	1.591	1.054	.921	2.706	-.116	.356	1.002	-.361	.125	

C FILENAME= H910A025.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
15.99	25.00	5.763	4.470	15.198	4.294	4.118	.096	1.539	-.118	.904	
15.01	25.00	2.487	-1.315	31.928	.691	.379	-.080	-1.623	-.586	-2.309	
13.98	25.00	-9.824	-6.627	.864	-6.833	-5.385	-.763	-3.474	-2.165	-.759	
13.01	25.00	-9.883	-6.685	.076	-7.019	-5.834	-.482	-3.190	-2.581	-.353	
12.01	25.00	-2.223	-1.530	.490	-1.960	-1.983	.411	-1.132	-.712	-.124	
11.01	25.00	-1.289	-.198	.092	.173	-1.306	-.063	-.305	-.253	-.136	
10.01	25.00	-1.489	.676	.039	.782	-.870	.018	.124	-.261	-.122	
9.00	25.00	.164	.202	-.042	-.200	.015	-.010	.071	.005	.068	
8.00	25.00	-.680	.130	-.054	-.103	-.120	.007	.107	-.147	-.130	
7.00	25.00	18.837	4.564	5.151	9.741	8.655	.528	.244	3.068	1.397	

C FILENAME= H910A050.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
22.00	50.01	5.214	16.415	35.236	5.314	4.822	.012	2.974	.421	-.163	
20.00	50.01	11.089	18.201	6.274	8.093	9.962	.834	4.356	1.350	.883	
18.00	50.01	.775	8.450	4.978	.810	2.015	-.953	.548	1.812	-1.094	
15.99	50.01	-16.610	-5.901	3.604	-11.235	-9.904	.792	-6.485	-3.684	.985	
15.01	50.01	-15.110	-7.847	5.811	-12.135	-12.109	.907	-5.975	-4.652	-.481	
14.00	50.01	-16.038	-8.647	.860	-11.668	-11.942	.534	-5.544	-4.321	.495	

13.01	50.01	-9.561	-5.671	.943	-7.829	-7.921	1.047	-3.185	-2.424	.138
12.00	50.01	-4.737	-4.902	.518	-3.980	-5.251	-.039	-1.958	-1.273	.169
11.01	50.01	-3.691	-2.105	.365	-2.395	-2.354	-.169	-.919	-.377	-.334
10.01	50.01	-5.175	-1.806	.159	-1.655	-2.106	-.051	-.489	-.536	-.208
9.00	50.01	-6.929	.413	2.297	1.273	-.870	.014	.094	-1.063	.898

C FILENAME= H910A075.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 17 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	75.00	14.451	19.985	.042	12.070	7.392	3.751	5.547	2.493	.082	
24.00	75.00	9.198	21.233	1.646	7.749	4.803	1.578	3.141	2.304	-.290	
22.00	75.00	5.050	15.911	2.364	6.226	1.913	-.341	.643	.712	.102	
21.00	75.00	.364	6.333	1.306	1.187	-3.936	-.885	-.723	1.274	-.754	
20.00	75.00	1.121	11.579	3.565	1.381	-2.665	.887	.032	.265	-.915	
18.00	75.00	-12.087	-4.766	1.042	-7.247	-11.518	-.564	-5.115	-2.610	1.411	
16.00	75.00	-13.229	-3.612	2.522	-8.666	-10.366	.882	-4.938	-2.338	.793	
13.99	75.00	-11.436	-3.672	1.811	-6.670	-6.336	-.052	-3.109	-1.970	.488	
12.00	75.00	-16.344	-3.485	.912	-4.481	-3.617	-.432	-1.464	-1.721	-.564	
11.01	75.00	-.623	7.353	.292	14.590	1.655	-.405	5.950	-1.575	-.077	
10.01	75.00	64.995	11.894	-.073	21.796	12.023	1.036	7.913	8.418	-.392	
8.99	75.00	365.086	57.559	34.343	124.875	89.449	11.661	28.527	65.343	4.770	
7.99	75.00	824.162	213.161	29.915	335.669	262.621	26.813	119.019	183.825	15.997	
5.99	75.00	947.620	304.129	-64.660	365.143	314.226	21.521	184.222	156.662	24.459	
5.01	75.00	875.199	317.222	-119.410	315.672	223.678	4.335	145.247	-18.400	-35.543	
3.99	75.00	806.435	332.287	-94.775	262.985	255.678	-36.053	85.109	-22.027	-9.691	
3.01	75.00	544.053	310.744	-240.650	112.648	83.569	59.941	91.491	-161.282	-33.843	

C FILENAME= H910A150.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	150.00	1.081	4.230	.936	1.434	.795	-.135	.437	.000	-.180	
24.00	150.00	.291	2.572	.854	.769	-.047	.197	.958	-.182	-.140	
22.00	150.00	.671	2.440	.725	.119	.597	-.338	.293	-.264	.230	
20.00	150.00	3.837	2.769	.583	1.531	1.948	-.387	1.183	1.062	-.386	
18.00	150.00	12.235	2.538	1.807	3.576	2.259	.254	3.077	3.390	-.106	
16.00	150.00	29.935	4.926	-.430	8.757	5.398	.196	3.851	8.196	-.619	
13.99	150.00	136.151	10.020	5.877	26.343	20.878	2.925	9.147	35.038	1.149	
12.00	150.00	641.860	75.019	20.726	186.612	133.900	12.230	41.069	130.059	14.519	
10.01	150.00	463.331	117.523	-16.708	186.317	170.730	6.736	82.872	145.401	-39.628	
8.00	150.00	112.704	115.886	-26.546	78.417	112.892	8.740	70.762	87.079	-22.541	
6.00	150.00	-98.463	67.399	-69.327	-6.619	46.711	32.500	35.301	-16.051	8.832	
3.99	150.00	-232.690	55.858	-47.857	-70.630	-67.032	23.761	-.886	-65.234	12.723	
2.00	150.00	-274.785	34.266	-58.709	-97.961	-135.850	-.890	-5.114	-94.865	47.819	
.00	150.00	-312.290	34.718	-24.355	5.838	-131.566	10.724	-10.352	-58.159	87.618	

C FILENAME= H910A225.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	224.99	10.404	2.712	1.544	2.542	2.251	-.249	1.878	2.861	-1.892	
23.99	224.99	11.900	2.153	4.267	3.260	2.773	-.376	2.104	1.904	-.962	
21.99	224.99	10.578	1.820	3.059	2.573	1.847	-.078	1.366	2.042	-.481	
20.00	224.99	32.165	2.004	3.229	6.552	5.232	-.185	2.839	7.571	-.011	
18.00	224.99	125.142	6.206	4.020	22.748	15.613	-.332	9.955	26.862	3.579	
15.99	224.99	443.888	39.644	8.411	113.133	69.927	3.981	23.470	70.004	16.748	
13.99	224.99	308.127	72.701	8.657	95.962	94.187	-1.532	37.167	86.052	-8.029	
11.99	224.99	48.722	58.825	5.066	11.894	49.567	5.108	30.872	43.050	-7.941	
9.99	224.99	32.189	42.570	-15.959	11.495	38.183	-1.880	24.624	19.109	-25.938	
7.99	224.99	-105.125	26.743	-6.793	-37.053	11.684	9.622	23.747	-8.546	15.040	
5.99	224.99	-24.205	12.309	14.128	-27.152	-12.824	1.056	3.591	-27.057	29.185	

3.98	224.99	-119.602	-1.126	-18.155	-24.606	-34.397	-4.028	11.649	-21.843	22.491
2.00	224.99	-179.148	8.407	-5.832	-39.740	-42.751	3.486	-1.081	-41.546	18.667
.00	224.99	-145.987	-6.803	-17.867	-7.455	-46.711	1.674	-10.709	-36.749	29.430

C FILENAME= H910A001.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	1.50	.005	.002	.003	.001	.001	.002	.001	.002	.001	.001
24.00	1.50	.003	.002	.002	.001	.000	.002	.001	.001	.000	.001
22.00	1.50	.003	.000	.003	.000	.001	.001	.000	.000	-.001	.001
20.00	1.50	.000	.000	.005	.003	-.001	.001	.002	.002	.000	.003
18.00	1.50	-.017	.001	.005	.007	-.003	.002	.002	.002	-.002	.003
16.00	1.50	-.054	-.001	.009	.008	-.006	-.001	.001	.002	.001	.001
15.00	1.50	-.100	.048	-.017	.036	-.057	.007	.018	-.036	.003	.003
14.00	1.50	14.580	9.204	.525	9.330	8.692	.705	1.502	2.628	.193	

C FILENAME= H910A010.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	9.99	.005	.002	.000	.001	.001	.000	.000	.000	.001	.001
24.00	10.01	.005	.001	.003	.001	.001	.001	.001	.001	.004	.001
22.00	10.00	.004	.001	.005	.001	.000	.002	.002	.002	.002	.002
20.00	10.01	.002	.002	.005	.001	-.001	.001	.000	.000	-.001	.002
18.00	10.01	-.014	.005	.006	.004	-.005	.001	.001	.001	-.003	-.002
15.99	10.01	-.040	.177	.051	.143	.166	.088	.145	.145	-.017	.056
15.00	10.01	13.741	8.513	.352	8.069	7.588	.594	2.744	3.558	.505	
14.00	10.01	7.910	6.912	-.830	4.974	5.625	1.418	2.577	3.797	1.658	
13.02	9.99	-3.732	-1.014	-2.164	-1.853	-.848	.376	-.661	-1.900	1.238	

C FILENAME= H910A025.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	25.00	.005	.001	.005	.001	.001	.001	.001	.001	.001	.001
24.00	25.00	.004	.002	.001	.000	.000	.000	-.001	.000	.000	.000
22.00	25.00	.001	.006	.002	.003	-.001	.000	.002	.002	-.001	.001
20.00	25.00	-.026	.017	.005	.004	-.012	.002	.007	.007	-.001	.000
18.00	25.00	.206	.372	-.147	.196	.192	-.010	.126	.036	-.042	
16.00	25.00	16.468	7.959	-.137	7.940	6.863	.693	2.031	3.462	.291	
13.99	25.00	-1.714	-.375	-.754	-.832	-.776	-.419	.661	-1.264	-.467	
12.00	25.00	-10.744	-3.179	-.400	-5.182	-3.815	-.421	-2.173	-3.010	.514	

C FILENAME= H910A050.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	50.01	-.038	.035	.004	.006	-.019	-.003	.003	-.001	.001	.001
24.00	50.01	-.055	.172	-.010	.034	-.032	-.016	.022	-.019	-.006	
22.00	50.01	.072	.599	.003	.122	.207	.001	.185	.004	-.015	
20.00	50.01	8.746	5.805	-.526	4.071	4.751	-.303	1.840	2.168	-.700	
18.00	50.01	17.568	16.351	-.048	10.518	11.843	.554	3.860	4.303	-.198	
16.00	50.01	4.037	12.139	-1.447	3.544	7.002	-.628	-1.246	.779	-.129	
13.99	50.01	-8.605	2.515	.187	-5.100	-1.718	-.929	-2.811	-3.228	-.273	
12.00	50.01	-12.562	-1.492	.264	-5.902	-3.816	-.499	-1.700	-1.680	.547	

C FILENAME= H910A075.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
 C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
 C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	26.00	75.00	.766	1.588	.006	.486	.869	-.001	.346	.133	-.018
	24.00	75.00	8.891	9.001	-.606	4.665	6.125	-.343	2.576	2.570	-.646
	22.00	75.00	15.231	17.363	-1.395	10.832	12.361	-.073	4.178	4.453	-.547
	20.00	75.00	12.969	22.315	.346	9.432	13.428	.089	2.714	4.363	-.201
	18.00	75.00	4.128	13.266	.366	2.681	5.284	-1.236	.571	1.727	-1.210
	15.99	75.00	-6.099	7.288	-.541	-4.063	-.391	-1.360	-2.816	-1.535	.119
	13.98	75.00	-9.314	2.488	.334	-3.569	-.948	-1.103	-1.356	.189	-.637
	11.99	75.00	-12.138	.520	-.797	-1.478	-.639	-.687	.134	.118	-.740
	10.01	75.00	4.981	1.422	.175	3.207	3.138	.708	2.003	3.620	2.266

C FILENAME= H910A150.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
 C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	26.00	150.00	-.458	4.253	-.726	1.107	1.776	-.442	.822	1.650	.253
	24.00	150.00	-1.108	3.596	.172	.832	2.012	-.551	.396	1.431	.485
	21.99	150.00	2.204	2.622	-1.614	.854	1.769	-.098	1.019	1.604	.087
	20.00	150.00	.129	3.091	-1.586	.640	1.490	-.049	.777	1.228	.127
	18.00	150.00	7.790	2.480	.281	2.444	2.951	-.473	1.252	2.047	-1.329
	15.99	150.00	14.632	2.150	.908	2.542	3.647	.672	1.893	4.241	-.667
	13.99	150.00	54.371	3.342	4.012	6.618	7.155	1.226	2.839	7.973	-1.497
	11.99	150.00	433.947	10.692	12.204	58.756	45.915	3.403	19.211	80.675	-3.562
	10.00	150.00	1520.931	98.716	-28.174	370.951	242.491	.252	87.363	313.234	-94.495

C FILENAME= H910A225.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
 C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	24.00	224.99	8.529	1.837	-.212	2.502	1.966	.350	1.775	2.828	.326
	22.00	224.99	13.352	2.091	-.238	2.181	2.831	.383	1.891	3.417	-1.306
	20.00	224.99	19.218	2.573	.740	1.051	3.681	.949	2.874	6.201	-.751
	18.00	224.99	47.113	2.082	-.925	3.636	8.712	1.129	1.895	10.460	-1.952
	16.00	224.99	226.099	7.689	-9.319	28.078	26.281	1.021	6.478	37.702	-9.970
	13.98	224.99	610.585	58.387	-13.838	171.353	128.819	2.835	37.748	131.841	-16.770
	11.99	224.99	886.338	92.028	-23.204	249.748	180.213	-3.171	37.467	145.100	-72.778
	10.00	224.99	395.767	113.335	-27.368	155.002	150.415	.681	47.844	134.532	-62.446

C FILENAME= H910AAX.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=0 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
 C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 22 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	.00	1.50	-87.970	-5.887	-3.569	-7.544	-55.685	-1.071	.065	-4.527	.112
	.00	9.99	-89.744	1.101	5.366	-2.582	-61.014	4.336	-3.549	-12.483	-.591
	.00	20.00	-91.203	-5.843	13.955	-2.911	-69.367	3.147	2.806	-15.479	8.344
	.00	30.00	-160.425	-9.364	2.053	14.437	-120.660	8.024	-4.632	-20.315	15.304
	.00	40.01	-450.552	-24.895	23.117	-17.819	-268.002	2.159	-5.184	-35.735	31.361
	.00	50.01	-1029.567	-48.922	82.893	10.017	-591.720	29.863	22.887	-123.032	47.646
	.00	60.01	-1502.238	75.065	50.352	23.718	-737.912	90.181	-11.550	-236.167	243.795
	.00	70.00	-1081.373	66.723	-46.689	51.971	-650.900	38.663	-11.523	-137.459	136.247
	.00	80.00	-721.883	-64.057	5.633	85.661	-377.494	9.926	-24.513	-136.079	135.917
	.00	90.00	-354.860	24.212	-28.932	4.310	-283.321	6.094	-14.421	-142.766	126.007
	.00	100.00	-156.685	-29.255	38.505	-37.933	-183.546	9.104	-9.518	-149.521	6.850
	.00	110.00	-80.893	10.745	-41.396	-11.854	-171.965	6.568	-40.658	-100.645	45.520
	.00	120.00	-113.858	8.896	-1.134	-24.621	-97.892	7.825	-25.003	-82.638	16.397
	.00	130.00	-68.767	15.706	-9.503	-17.950	-91.901	29.162	-32.711	-84.635	16.813
	.00	140.01	-26.552	-7.046	27.341	-27.531	-49.845	-3.789	9.714	-81.442	32.559
	.00	150.00	-54.684	.654	-6.674	-21.696	-40.904	-9.455	-6.697	-68.489	8.071

.00	160.01	-35.158	8.735	10.201	-8.571	-18.388	-9.474	-13.093	-55.635	30.547
.00	170.00	-46.869	-8.660	-1.157	2.255	-5.947	5.243	2.629	-32.249	7.874
.00	180.00	-11.563	6.847	5.065	-16.861	-28.017	-9.884	-4.793	-43.937	19.545
.00	190.01	-33.267	7.424	-14.184	13.673	-20.364	1.566	4.696	-44.147	21.872
.00	200.00	-12.499	-.346	4.332	3.657	-9.893	-8.210	4.344	-37.920	12.712
.00	225.01	-25.958	-5.128	25.229	-1.711	.133	-3.685	-9.656	-25.486	14.612

C FILENAME= H904A001.J_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
4.70	1.50	40.383	4.218	2.012	11.492	5.335	7.141	19.370	-.559	-1.173	
4.51	1.50	53.430	2.067	1.990	16.069	8.412	6.758	37.920	-.543	-6.864	
4.30	1.50	72.362	2.113	1.109	18.736	10.552	6.806	44.752	-1.080	-7.813	
4.00	1.50	91.288	1.494	.537	16.024	8.913	6.972	46.124	-1.664	-4.921	
3.49	1.50	103.895	.678	.374	11.732	7.627	7.162	39.229	-.819	-3.870	
3.01	1.50	110.943	.695	.696	10.207	6.897	7.133	31.270	.134	-3.573	
2.49	1.50	116.721	.426	.445	9.052	6.596	6.500	25.089	.541	-4.699	
2.00	1.50	120.962	.232	.247	8.395	5.944	6.103	19.743	1.393	-1.646	
1.50	1.50	124.389	.432	.137	7.477	5.733	5.625	14.381	.146	-1.937	
.99	1.50	127.509	.164	.097	6.910	5.362	5.194	11.236	-.143	-1.624	
.51	1.50	129.352	.032	.012	6.353	4.978	4.863	6.173	.717	-2.212	
.01	1.50	130.160	.001	-.001	6.243	4.936	4.570	1.985	.418	-1.805	

C FILENAME= H904A010.J_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
5.50	10.01	51.940	11.972	5.242	15.243	12.375	16.260	119.284	-3.818	-6.450	
4.99	10.01	60.036	12.064	4.903	16.862	12.665	16.359	126.302	-1.777	-8.456	
4.51	10.01	68.664	9.709	4.033	18.411	13.372	15.965	123.777	-2.310	-21.042	
3.99	10.01	82.532	6.545	3.314	19.378	13.254	14.994	105.242	5.736	-22.463	
3.42	10.01	96.032	1.742	2.301	17.259	12.292	12.861	76.342	-3.266	-20.280	
2.71	10.01	107.880	-.619	1.274	14.328	10.257	10.134	59.417	-2.495	-8.435	
2.01	9.99	116.029	-.811	.758	10.804	8.013	7.461	28.489	-1.107	-4.697	
1.29	9.99	121.748	-.609	.380	8.723	6.520	6.111	16.943	-.050	-2.943	
.61	9.99	125.466	-.901	.206	7.664	5.625	5.228	8.962	.138	-2.709	
.00	9.99	127.080	-1.035	.325	6.929	5.354	4.952	3.798	-.528	-2.026	

C FILENAME= H904A025.J_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 13 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
7.99	25.00	43.437	4.394	6.989	12.674	11.048	12.435	16.416	.126	-2.087	
7.00	25.00	46.055	7.038	6.532	12.729	11.098	14.022	53.677	-.861	-2.186	
6.01	25.00	50.729	8.306	6.178	14.435	11.632	15.556	90.290	-8.833	-14.738	
5.49	25.00	54.794	8.912	5.362	15.802	11.887	16.413	104.354	1.050	-9.924	
5.00	25.00	57.864	8.586	5.203	16.523	12.662	16.803	113.009	2.419	-5.296	
4.50	25.00	62.663	8.003	4.757	17.202	12.749	17.162	114.261	-.207	-9.127	
4.01	25.00	67.947	7.432	4.325	18.020	13.320	16.639	113.540	-7.323	-19.253	
3.41	25.00	77.940	6.410	3.788	19.408	13.562	16.134	102.907	-2.649	-21.557	
2.70	25.00	89.439	4.492	3.062	19.451	13.196	15.276	92.649	3.944	-24.651	
2.01	25.00	100.476	2.076	2.123	18.260	12.089	13.661	77.892	3.489	-26.090	
1.29	25.00	109.338	.221	1.109	15.989	11.399	11.336	59.757	1.557	-11.454	
.60	25.00	116.105	-.523	.897	12.941	10.176	9.634	42.626	2.184	-10.756	
.00	25.00	119.865	-1.172	.467	11.173	8.947	8.543	18.756	2.927	-11.596	

C FILENAME= H904A050.J_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

```

C D090894
C 11 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
8.81 49.99 40.846 4.630 5.918 12.419 10.005 11.640 12.621 1.727 -3.374
8.20 49.99 42.216 4.432 5.236 12.440 10.879 12.217 14.501 2.674 -4.591
7.01 49.99 45.940 6.814 4.914 12.943 9.767 13.069 61.247 -1.226 -2.091
5.99 49.99 49.358 6.320 3.173 13.872 10.668 13.909 65.856 .392 -1.821
5.00 49.99 54.590 6.836 3.287 14.459 11.236 15.013 85.015 5.206 4.824
3.99 49.99 61.018 6.875 2.396 16.574 12.229 15.192 90.822 1.749 -1.807
2.73 49.99 69.151 5.840 1.606 17.784 12.849 15.459 87.294 1.816 -5.681
2.01 49.99 73.364 4.661 1.026 18.667 13.634 15.450 88.929 5.917 -9.422
1.29 49.99 80.808 3.731 .884 19.050 13.570 14.996 75.479 2.706 -16.564
.60 49.99 83.540 2.351 .430 18.934 14.036 14.325 53.765 6.846 -19.777
.00 49.99 86.729 1.424 .301 19.127 13.992 14.236 46.533 2.496 -24.027

```

```

C FILENAME= H904A075.J_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894

```

```

C 11 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
9.50 75.00 36.965 4.423 4.961 10.112 7.464 9.049 23.819 -.412 -.363
8.20 75.00 40.955 4.893 3.955 10.371 7.553 9.990 34.462 -.774 .178
7.00 75.00 42.799 3.861 2.875 10.275 8.053 10.435 26.292 -2.208 -.875
6.01 75.00 46.762 4.759 2.454 11.278 8.431 10.751 39.688 1.883 3.204
4.99 75.00 49.659 4.881 1.624 11.439 8.648 11.179 40.661 -.894 2.392
4.01 75.00 52.499 4.602 1.204 12.183 9.150 11.603 44.169 -2.928 2.732
2.72 75.00 54.486 3.303 .459 12.405 9.399 11.737 40.341 -1.227 -.840
2.01 75.00 57.766 3.418 .582 12.483 9.676 11.865 34.556 2.092 -2.221
1.29 75.00 59.273 2.550 .241 12.692 9.808 11.821 27.399 .093 -.316
.61 75.00 61.049 2.161 .233 13.169 10.073 11.433 23.326 -1.222 -5.202
.00 75.00 62.194 1.626 -.112 12.640 10.316 11.666 18.046 3.303 -1.802

```

```

C FILENAME= H904A150.J_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894

```

```

C 9 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
13.99 150.00 29.324 3.167 3.126 5.863 4.028 5.296 9.852 .043 -.628
12.00 150.00 30.726 3.039 2.525 5.914 4.066 5.115 9.253 .898 .083
10.01 150.00 31.997 2.817 1.723 5.998 4.165 5.323 8.313 -.178 .703
7.99 150.00 33.687 2.473 1.264 5.847 4.338 5.342 7.287 .006 .979
5.99 150.00 34.913 2.160 .800 5.902 4.252 5.191 5.046 .619 2.336
3.98 150.00 37.109 2.124 .467 5.968 4.408 5.431 4.635 .270 2.718
2.01 150.00 37.181 1.363 .182 5.939 4.510 5.257 2.884 .694 2.206
1.00 150.00 37.597 1.138 -.077 6.016 4.510 5.215 2.852 .174 2.062
.01 150.00 37.905 .799 -.076 5.992 4.543 5.389 .912 .527 1.548

```

```

C FILENAME= H904A225.J_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C D090894

```

```

C 10 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
18.00 224.99 25.810 2.400 1.964 4.048 2.853 3.703 3.770 .436 .428
16.00 224.99 26.839 2.339 1.970 4.079 2.876 4.090 3.933 .144 .443
13.99 224.99 27.683 2.261 1.381 4.145 3.037 3.784 3.647 .318 .543
12.00 224.99 27.963 1.988 1.140 3.996 2.979 3.681 3.158 .421 .440
10.01 224.99 28.748 1.825 .913 4.081 3.001 3.746 2.734 .246 .848
7.99 224.99 29.152 1.626 .548 4.085 3.119 3.591 2.175 -.323 1.169
5.99 224.99 29.857 1.259 .589 4.197 3.056 3.527 1.520 -.079 .846
3.98 224.99 29.796 1.141 .351 4.105 3.085 3.515 1.394 .098 .946
2.00 224.99 29.800 .888 .052 3.998 3.070 3.618 .202 -.168 .551
.00 224.99 29.747 .501 .053 4.016 3.040 3.590 -.095 -.005 1.157

```

```

C FILENAME= H904A001.A_1
C

```

```

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 10 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
13.49 1.50 23.082 4.314 16.709 2.921 3.343 4.271 2.597 3.432 .093
13.01 1.50 23.360 4.397 18.023 2.315 2.789 2.714 .778 1.769 -.314
12.51 1.50 23.590 4.465 18.403 2.093 2.641 2.062 .167 1.068 -.135
12.01 1.50 23.866 4.534 18.584 2.082 2.561 1.871 -.177 .721 -.255
11.19 1.50 23.969 4.684 18.259 2.126 2.471 1.882 -.203 -.120 -.504
10.40 1.50 24.486 5.006 17.012 2.257 2.359 2.193 -.146 -1.272 -.606
9.60 1.50 24.450 5.621 15.212 2.305 2.161 2.206 -.605 -1.233 .236
8.20 1.50 20.948 4.686 12.362 3.733 2.259 2.370 -1.259 .490 2.533
6.99 1.50 14.143 2.309 9.054 4.206 2.623 3.262 -2.198 .186 1.840
6.01 1.50 8.236 -.018 6.459 3.848 2.353 3.437 .000 -.006 -.986

```

```

C FILENAME= H904A010.A_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 9 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
18.00 9.99 11.869 6.507 6.742 4.818 5.519 5.357 10.157 7.012 .491
16.00 9.99 20.607 7.249 11.457 4.651 4.771 4.714 10.107 4.748 2.156
13.99 9.99 24.260 6.700 14.925 2.490 2.885 2.583 .655 .467 .615
13.02 10.00 23.825 6.623 14.300 2.537 2.377 2.689 -.810 -.874 1.749
11.98 10.00 21.971 6.521 11.812 2.935 2.160 2.923 -.532 -1.038 2.698
11.01 10.00 20.069 5.922 9.122 3.318 2.087 2.554 .266 -.276 2.311
10.00 10.00 17.664 4.729 7.363 3.549 2.281 2.364 1.207 -.015 1.768
9.01 10.00 14.719 2.832 5.776 3.750 2.525 2.511 2.823 -.235 .955
8.01 10.00 11.488 .219 4.845 4.600 3.580 2.711 5.995 -.287 -.229

```

```

C FILENAME= H904A025.A_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 15 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
24.00 25.00 10.174 5.371 3.635 4.529 5.512 4.682 8.266 4.909 .760
23.00 25.00 12.264 5.648 4.555 4.925 5.647 4.758 12.086 5.151 1.589
22.00 25.00 14.730 6.184 5.621 5.284 5.499 4.805 12.644 5.110 3.006
21.00 25.00 17.235 6.310 6.540 5.049 5.377 4.856 12.373 5.775 2.605
20.00 25.00 18.966 5.782 7.264 5.136 5.327 4.647 12.743 5.875 3.163
19.00 25.00 21.654 5.871 8.309 4.575 4.991 4.172 10.243 4.368 2.650
18.01 25.00 22.903 5.398 8.775 3.951 4.733 3.864 7.160 3.590 2.558
16.98 25.00 23.783 4.820 9.190 3.478 4.305 3.338 3.950 2.338 1.897
16.01 25.00 23.529 4.032 9.194 3.232 3.786 2.999 1.097 1.204 1.981
14.99 25.00 22.860 2.826 8.957 3.385 3.390 2.885 .417 .462 2.437
14.01 25.00 20.294 1.676 8.273 3.884 3.077 2.870 .030 .410 3.646
13.01 25.00 18.544 .058 7.933 3.920 2.870 2.867 -.011 -.333 3.098
12.00 25.00 14.892 -1.834 7.418 4.515 3.112 3.039 1.290 -.537 2.723
11.01 25.00 10.664 -3.246 7.182 4.964 4.683 3.635 -.410 -.493 1.481
10.99 25.00 10.356 -3.619 6.979 5.020 4.034 3.449 2.058 -.503 .473

```

```

C FILENAME= H904A050.A_1
C
C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm
C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.
C D090894
C 14 : No. of data points
C y x U V W SIG(u') SIG(v') SIG(w') u'v' v'w' w'u'
26.00 50.01 15.219 4.137 4.406 4.004 4.189 3.955 5.925 3.532 1.433
24.00 50.01 17.010 3.408 5.028 3.941 4.096 3.555 4.716 2.599 1.713
22.00 50.01 17.238 2.477 5.092 3.833 4.059 3.405 3.758 2.871 1.528
20.00 50.01 18.078 1.514 5.565 3.431 3.717 3.215 2.334 2.513 1.219
18.00 50.01 17.421 .313 5.946 3.369 3.507 3.170 1.294 2.604 .754
15.99 50.01 16.176 -.975 6.054 3.230 3.104 3.058 .658 2.031 .468
15.01 50.01 15.368 -1.446 6.139 3.263 3.030 2.928 -.394 1.965 .380
14.01 50.01 14.479 -1.859 5.912 3.238 2.928 2.996 -.570 2.433 .331

```

13.00	50.01	13.916	-2.282	5.914	3.209	2.858	3.075	-.551	2.452	.653
12.00	50.01	13.259	-2.571	5.828	3.311	2.865	3.115	-.812	2.453	.336
11.01	50.01	13.101	-2.861	5.711	3.222	2.925	3.296	-.274	2.681	.606
9.99	50.01	12.806	-3.023	5.507	3.454	3.063	3.784	-.033	2.901	.793
9.00	50.01	13.839	-3.050	5.712	4.390	4.386	5.245	3.731	3.462	2.636
8.00	50.01	19.203	-1.673	6.459	10.056	8.184	8.947	40.248	12.358	7.157

C FILENAME= H904A075.A_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 18 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	75.00	15.188	2.058	3.542	3.012	3.078	2.694	1.706	1.760	.696	
24.00	75.00	15.540	1.576	3.886	2.824	2.957	2.630	1.041	1.414	.582	
22.00	75.00	15.453	1.129	4.230	2.729	2.889	2.544	.865	1.438	.356	
21.00	75.00	15.426	.968	4.454	2.657	2.920	2.428	.825	1.531	.563	
20.00	75.00	14.709	1.163	4.415	2.692	2.825	2.433	.040	1.387	.457	
19.00	75.00	15.248	.598	4.600	2.590	2.749	2.420	.348	1.556	.342	
18.01	75.00	14.981	.442	4.696	2.549	2.678	2.320	.191	1.382	.394	
15.99	75.00	14.847	.100	4.910	2.448	2.617	2.362	.341	1.494	.642	
13.99	75.00	14.754	-.149	5.099	2.606	2.673	2.596	.720	1.773	.700	
11.99	75.00	15.110	-.740	5.219	2.684	2.679	2.819	.794	2.192	.946	
11.01	75.00	15.588	-1.046	5.193	3.134	2.846	3.231	1.567	2.392	1.422	
9.99	75.00	16.704	-1.226	5.203	4.442	3.531	4.411	3.587	3.566	2.417	
9.00	75.00	19.680	-1.141	5.300	7.261	4.891	5.731	13.437	5.938	3.989	
8.00	75.00	23.987	-.638	4.722	10.180	6.695	7.171	31.027	5.278	2.257	
5.99	75.00	33.640	-.506	4.008	13.283	9.062	9.837	53.963	7.771	-1.539	
5.01	75.00	38.962	-.199	3.552	14.282	10.099	10.819	64.465	12.332	2.082	
4.00	75.00	42.967	-.603	3.062	14.997	10.452	11.345	61.910	12.893	-2.989	
3.02	75.00	46.444	-1.122	3.046	15.090	10.936	11.528	57.528	10.960	-8.503	

C FILENAME= H904A150.A_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	149.99	13.408	.667	2.366	1.843	1.706	1.646	.991	.573	.179	
24.00	149.99	13.800	.464	2.547	1.876	1.700	1.700	.803	.602	.222	
22.00	149.99	14.092	.304	2.567	1.905	1.621	1.684	.779	.669	.242	
20.00	149.99	14.540	.122	2.668	2.056	1.694	1.773	.802	.862	.203	
18.00	149.99	14.984	-.070	2.750	2.248	1.739	1.863	.817	.766	.272	
16.00	149.99	15.787	-.250	2.898	2.855	1.895	2.254	1.271	1.053	.804	
13.99	149.99	17.387	-.305	2.953	4.072	2.500	2.807	3.080	.870	.698	
12.00	149.99	20.031	-.103	3.005	5.655	3.492	3.698	8.605	1.612	1.361	
10.01	149.99	22.739	.021	2.605	6.404	4.085	4.341	10.916	2.016	1.349	
7.99	149.99	25.972	.291	1.911	7.078	4.554	4.850	12.699	.963	-1.042	
5.99	149.99	28.282	.162	1.276	7.130	4.834	5.276	12.761	.979	.233	
3.98	149.99	30.074	-.005	1.083	6.923	5.090	5.351	9.854	.571	1.121	
2.01	149.99	31.963	-.331	.764	6.952	5.187	5.429	6.967	.557	.986	
.00	149.99	32.691	-.437	.549	6.828	5.221	5.510	4.119	.532	-.820	

C FILENAME= H904A225.A_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
26.00	224.99	13.327	-.001	1.542	2.076	1.437	1.736	1.007	.605	.465	
24.00	224.99	13.708	-.081	1.606	2.213	1.438	1.797	1.053	.614	.472	
22.00	224.99	14.261	-.181	1.730	2.430	1.492	1.929	1.139	.661	.692	
20.00	224.99	14.934	-.290	1.761	2.926	1.637	2.172	1.776	.714	.880	
18.00	224.99	15.984	-.332	1.739	3.497	1.848	2.334	2.568	.836	1.208	
15.99	224.99	17.101	-.366	1.702	4.063	2.103	2.504	3.646	.931	1.538	
13.99	224.99	19.012	-.096	1.779	4.644	2.607	2.898	5.454	1.064	1.708	
11.99	224.99	20.059	-.196	1.484	4.883	2.744	3.092	5.822	.785	1.421	
9.99	224.99	21.887	.041	1.328	4.979	3.082	3.262	6.337	.670	1.721	

7.99	224.99	23.482	.222	.862	4.920	3.228	3.447	5.740	.203	1.641
5.99	224.99	24.273	-.080	.816	4.746	3.304	3.554	4.804	-.251	1.140
3.98	224.99	25.257	-.020	.509	4.666	3.320	3.518	3.357	.130	1.786
2.01	224.99	25.998	.063	.282	4.656	3.463	3.575	2.323	-.042	1.905
.00	224.99	26.145	-.099	.119	4.573	3.400	3.556	.953	.114	1.819

C FILENAME= H904A001.E_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	1.50	4.059	-.205	.074	.269	.213	.360	-.010	.013	.010
	24.00	1.50	3.970	-.249	.051	.297	.234	.392	-.019	.008	.005
	22.00	1.50	3.908	-.308	.071	.340	.245	.406	-.021	.015	.007
	20.00	1.50	3.758	-.413	.095	.399	.293	.417	-.036	.017	.009
	18.00	1.50	3.490	-.541	.149	.532	.436	.524	-.053	.030	.015
	16.00	1.50	3.676	-.714	1.059	1.240	1.685	1.943	-.200	.266	-.069
	15.01	1.50	8.295	.319	6.321	4.059	4.649	5.642	8.761	3.859	3.092
	14.01	1.50	19.333	.471	11.898	5.350	5.227	6.102	14.089	4.667	2.714

C FILENAME= H904A010.E_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	10.00	4.040	-.208	.050	.348	.336	.398	-.011	.017	.026
	24.00	10.00	4.021	-.216	.046	.437	.448	.441	-.034	.026	.040
	22.00	10.00	3.990	-.213	.055	.667	.775	.605	-.088	.073	.080
	20.00	10.00	4.478	-.210	.589	1.268	1.788	1.426	-.123	.219	-.026
	18.00	10.00	9.951	1.952	5.681	4.565	4.915	5.029	10.335	7.185	4.276
	16.00	10.00	19.425	3.364	10.529	5.489	5.585	4.945	14.384	7.623	2.964
	15.01	10.00	22.876	3.015	12.375	4.847	4.942	4.588	9.674	5.174	1.268
	14.00	10.00	24.350	2.092	14.117	4.002	4.213	3.869	5.877	3.285	.453

C FILENAME= H904A025.E_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 7 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	25.00	4.732	-.420	.506	1.588	2.027	1.633	.227	.373	-.007
	24.00	25.00	7.272	.282	2.000	3.257	3.748	3.375	5.231	3.248	2.110
	22.00	25.00	11.677	1.349	4.525	4.903	5.069	4.467	12.122	6.021	4.365
	20.00	25.00	16.875	2.115	6.431	5.421	5.543	4.672	15.795	6.550	4.024
	18.00	25.00	20.700	1.351	7.661	4.846	5.387	4.255	11.875	4.705	1.548
	15.99	25.00	22.147	.118	8.531	4.250	4.956	3.660	8.395	3.773	1.487
	13.99	25.00	20.203	-2.522	8.221	4.226	4.075	3.409	3.292	2.476	2.256

C FILENAME= H904A050.E_1

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	U	V	W	SIG(u')	SIG(v')	SIG(w')	u'v'	v'w'	w'u'
	26.00	50.00	13.409	1.453	3.611	4.182	4.225	3.648	8.303	3.409	1.870
	24.00	50.00	15.377	1.125	4.069	4.064	4.230	3.570	7.338	3.693	1.940
	22.00	50.00	16.056	.535	4.297	4.142	4.140	3.416	6.520	3.638	2.230
	20.00	50.00	16.525	-.325	4.916	3.861	3.873	3.259	4.543	3.220	1.055
	18.00	50.00	15.904	-1.162	5.335	3.745	3.691	3.147	2.174	3.616	.704
	17.00	50.00	15.217	-1.674	5.560	3.656	3.495	3.132	1.757	3.291	.164
	16.01	50.00	14.411	-1.853	5.763	3.703	3.271	3.043	.426	2.877	.365
	14.99	50.00	13.427	-2.269	5.807	3.814	3.172	3.040	-.651	3.038	.274
	14.01	50.00	12.583	-2.186	6.028	3.717	3.179	2.967	-1.480	2.664	.098
	13.00	50.00	11.996	-2.639	5.989	3.654	3.044	2.936	-1.883	3.034	.274
	12.00	50.00	11.250	-2.506	5.960	3.681	3.027	3.117	-2.336	3.046	.413


```

C  FILENAME= H904A075.E_1
C
C  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm
C  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C  D090894
C  15 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
26.00  75.00  14.578  .992  3.249  2.988  3.101  2.646  2.550  1.893  .686
24.00  75.00  14.496  1.206  3.508  3.062  3.121  2.497  .587  1.686  .368
22.00  75.00  14.743  .630  3.959  2.776  2.987  2.489  .748  2.031  -.027
20.00  75.00  14.731  .444  4.205  2.704  2.816  2.329  .774  1.637  -.069
19.00  75.00  14.327  -.058  4.362  2.757  2.807  2.400  .169  1.792  .099
18.01  75.00  13.978  .368  4.545  2.660  2.775  2.327  -.245  1.368  .079
17.00  75.00  13.872  -.159  4.571  2.653  2.699  2.298  .325  1.678  .195
16.00  75.00  13.727  -.225  4.787  2.589  2.649  2.302  .080  1.901  .252
15.01  75.00  13.609  -.402  4.889  2.667  2.614  2.338  .432  2.158  .413
14.01  75.00  13.585  -.393  4.972  2.681  2.574  2.388  .301  1.786  .776
13.01  75.00  13.805  -.533  5.044  2.854  2.648  2.708  .898  2.101  .617
12.00  75.00  13.998  -.620  5.185  2.969  2.755  2.824  .693  2.583  1.052
11.01  75.00  14.621  -.912  5.046  3.327  2.924  3.249  1.908  3.399  1.397
9.99  75.00  15.698  -1.263  4.972  4.275  3.300  3.956  2.714  3.710  1.299
9.01  75.00  17.812  -1.279  4.517  6.010  4.159  5.104  6.613  5.095  .284

```

```

C  FILENAME= H904A150.E_1
C
C  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm
C  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C  D090894
C  6 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
26.00  150.00  13.238  .609  2.382  2.077  1.771  1.693  1.118  .832  -.047
24.00  150.00  13.756  .483  2.433  2.041  1.752  1.602  1.073  .669  -.194
22.00  150.00  14.175  .369  2.487  2.075  1.755  1.733  .971  .933  -.026
18.00  150.00  15.538  .146  2.760  2.951  1.967  2.248  .984  1.159  -.308
16.00  150.00  16.465  .085  2.837  3.395  2.167  2.397  2.387  1.145  .078
13.99  150.00  19.371  .367  2.666  5.121  3.070  3.262  6.697  1.356  -1.062

```

```

C  FILENAME= H904A225.E_1
C
C  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm
C  LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.
C  D090894
C  10 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
26.00  224.99  13.387  -.087  1.383  2.180  1.456  1.682  .840  .591  -.016
24.00  224.99  14.520  .066  1.585  2.946  1.699  2.116  1.916  1.033  .508
22.00  224.99  14.599  -.284  1.403  3.007  1.732  1.984  1.693  .933  -.023
20.00  224.99  16.277  -.033  1.525  3.714  2.083  2.247  2.582  .956  -.452
18.00  224.99  18.222  .121  1.356  4.238  2.497  2.575  3.895  1.157  -.373
15.99  224.99  19.497  .268  1.300  4.312  2.750  2.816  4.691  .602  -1.202
13.99  224.99  21.110  .512  1.084  4.545  2.868  2.896  4.902  .688  -1.482
11.99  224.99  20.812  .165  1.120  4.659  2.791  2.891  4.945  .826  -1.365
10.00  224.99  22.260  .085  .809  4.558  2.850  3.160  3.909  .409  -1.558
8.00  224.99  23.356  .271  .935  4.489  2.983  3.055  3.414  .263  -1.725

```

```

C  FILENAME= H904AAX.J_1
C
C  H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm
C  LDV SEED PARTICLES ADDED TO JET FLUID ONLY.
C  D090894
C  22 : No. of data points
C  y      x      U      V      W      SIG(u') SIG(v') SIG(w')  u'v'  v'w'  w'u'
.00  1.50  129.999  .001  -.010  6.044  4.963  4.655  1.798  1.092  -1.129
.00  10.00  127.485  -.770  .297  6.657  5.202  4.844  3.154  .166  -.795
.00  20.00  124.431  -1.481  .603  9.221  7.220  6.678  9.466  .617  -3.795
.00  30.00  115.284  -1.012  1.002  13.761  11.219  10.029  22.822  6.621  -15.054
.00  40.01  102.083  .407  1.189  17.802  13.859  12.962  31.422  4.919  -25.531
.00  50.00  86.809  1.463  1.513  18.629  14.467  13.805  35.162  -1.744  -31.176
.00  60.01  74.397  .898  .903  16.595  12.783  13.536  28.557  2.592  -10.466
.00  70.00  63.127  .461  1.156  13.970  10.985  12.166  17.959  4.042  -10.422

```

.00	80.00	58.433	1.044	.186	11.312	9.300	10.674	13.817	-.200	-6.432
.00	90.00	53.218	.778	.313	9.788	7.888	9.562	8.006	1.062	-4.962
.00	100.00	49.522	.874	-.121	8.853	7.154	8.349	8.658	1.062	-.079
.00	110.00	46.415	.891	-.047	7.930	6.128	7.317	4.963	.175	-.896
.00	120.00	43.641	.989	-.094	7.222	5.658	6.657	2.693	-.662	.920
.00	130.00	41.185	.594	.112	6.859	5.204	6.227	3.006	-.073	.604
.00	140.00	39.887	.542	-.172	6.461	4.726	5.578	1.642	.067	.265
.00	150.01	37.942	.599	-.080	5.926	4.545	5.292	.310	.113	.688
.00	160.00	36.374	.808	-.101	5.582	4.303	4.991	.467	-.095	.768
.00	170.01	35.142	.388	.181	5.032	3.957	4.964	.795	.622	.717
.00	180.00	33.909	.604	.130	4.853	3.867	4.444	-.514	.198	.112
.00	190.01	32.864	.454	-.015	4.814	3.571	4.022	-.789	.157	.408
.00	200.01	31.782	.433	-.054	4.419	3.468	4.086	-.007	.282	.066
.00	224.99	29.833	.438	.150	3.860	2.998	3.764	-.387	.015	-.439

C FILENAME= H904A001.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 12 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
4.70	1.50	918.544	-18.093	22.748	198.393	121.994	11.002	14.756	47.920	10.085	
4.51	1.50	2494.387	168.211	47.573	522.527	368.078	-38.829	-5.261	49.791	-158.758	
4.30	1.50	999.423	286.346	37.389	33.622	-94.407	19.061	-8.305	-.111	8.169	
4.00	1.50	-1564.181	40.258	22.161	-367.690	-377.038	26.229	1.103	24.301	37.480	
3.49	1.50	-639.083	-89.448	33.188	-277.814	-187.966	12.954	1.230	-34.362	62.294	
3.01	1.50	-314.813	-84.408	-6.143	-179.434	-139.151	.452	-10.435	-26.193	-28.813	
2.49	1.50	-268.484	-56.934	-.985	-138.488	-104.819	.329	-2.191	-27.639	4.730	
2.00	1.50	-186.684	-43.904	5.534	-96.896	-76.692	-.979	-15.576	-42.641	-2.171	
1.50	1.50	-161.111	-42.592	8.114	-67.795	-84.332	9.888	-3.852	-20.890	14.014	
.99	1.50	-147.620	-32.839	4.400	-63.300	-71.503	7.818	-1.505	-20.031	19.861	
.51	1.50	-108.408	-19.924	9.535	-36.163	-53.774	1.410	-.949	-10.834	18.052	
.01	1.50	-110.191	-1.584	16.817	-13.298	-59.830	2.177	.958	-9.395	9.992	

C FILENAME= H904A010.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
5.50	10.01	1500.343	519.230	-751.789	973.551	991.074	11.632	38.239	66.183	-146.811	
4.99	10.01	1219.310	144.546	-486.059	497.570	564.509	10.533	58.023	-137.637	-51.916	
4.51	10.01	1676.237	101.148	-233.420	266.977	368.915	50.763	77.499	-38.577	-9.652	
3.99	10.01	-539.329	-93.486	108.955	-454.504	-384.402	-87.574	-47.072	-515.095	80.721	
3.42	10.01	-2229.229	-297.130	381.252	-724.947	-628.557	-70.820	-99.085	-374.746	179.451	
2.71	10.01	-1649.723	-529.960	182.244	-815.823	-667.387	66.059	-140.001	-187.364	239.204	
2.01	9.99	-423.350	-182.783	45.287	-243.969	-223.964	23.750	-59.153	-81.761	10.545	
1.29	9.99	-205.297	-65.346	6.829	-75.935	-105.923	21.259	-17.382	-36.268	34.529	
.61	9.99	-183.449	-34.609	14.655	-54.972	-72.341	6.013	-3.279	-18.246	10.107	
.00	9.99	-100.498	-15.559	11.564	-18.480	-56.015	8.030	-5.441	-16.867	17.205	

C FILENAME= H904A025.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 13 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
7.99	25.00	977.075	-158.160	-298.843	133.423	1055.650	-14.721	156.822	64.694	-118.765	
7.00	25.00	871.202	250.997	-659.128	485.428	1059.981	-18.280	245.840	201.293	19.132	
6.01	25.00	1504.632	483.101	-679.601	978.518	1047.663	-80.971	187.501	175.747	-181.917	
5.49	25.00	1647.525	547.012	-739.568	963.412	977.152	8.983	69.464	182.307	-93.925	
5.00	25.00	2055.079	629.430	-764.984	1170.115	1163.896	1.973	10.353	-47.545	-271.702	
4.50	25.00	2216.855	493.959	-949.510	878.142	908.115	-4.232	-198.974	-285.979	-206.187	
4.01	25.00	1980.300	335.041	-687.138	584.853	715.398	-18.207	74.973	-198.564	-200.243	
3.41	25.00	300.842	-111.593	-308.037	-187.923	122.601	51.605	-85.896	-656.513	-101.360	
2.70	25.00	-1803.820	-388.219	-120.195	-525.472	-502.404	150.973	-73.928	-651.395	63.310	
2.01	25.00	-3528.372	-543.008	193.288	-810.600	-975.761	211.578	-192.569	-768.059	188.437	
1.29	25.00	-3221.464	-512.194	166.833	-843.166	-1009.862	46.397	-69.392	-453.587	152.024	

.60	25.00	-1400.272	-343.754	171.918	-699.435	-780.903	64.735	-10.271	-294.230	68.929
.00	25.00	-788.473	-79.021	165.906	-233.221	-466.609	20.953	-74.558	-248.264	140.958

C FILENAME= H904A050.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	8.81	49.99	1213.615	-338.572	-234.784	-111.733	956.595	-57.188	85.105	144.566	-59.658
	8.20	49.99	1001.521	-583.750	-173.891	-86.589	1079.129	-103.691	89.046	228.786	-25.833
	7.01	49.99	964.263	338.162	-266.494	593.638	676.398	-16.702	64.042	206.536	-66.743
	5.99	49.99	1507.126	305.707	-281.496	696.993	911.175	18.155	158.789	200.221	-62.064
	5.00	49.99	1570.448	587.548	-198.574	890.884	960.158	79.690	124.887	66.273	-111.979
	3.99	49.99	2069.978	537.756	-358.374	663.415	914.544	106.157	144.145	-207.342	-188.758
	2.73	49.99	1707.440	308.915	-356.869	297.901	547.135	-18.711	66.779	-473.488	-21.753
	2.01	49.99	1337.915	422.656	-277.936	300.943	624.791	38.799	88.267	-264.224	-63.041
	1.29	49.99	276.218	138.511	-285.339	-131.024	59.949	-18.513	-12.054	-742.161	16.112
	.60	49.99	25.660	88.117	-474.264	-221.925	-159.780	111.772	72.104	-603.351	-162.384
	.00	49.99	-794.691	29.938	-189.332	-239.487	-395.643	-53.545	-108.610	-688.034	16.818

C FILENAME= H904A075.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	9.50	75.00	531.809	-23.465	-65.924	41.638	432.288	-21.873	61.130	123.121	-27.709
	8.20	75.00	395.974	125.791	-78.019	201.979	301.400	5.568	81.932	127.139	10.865
	7.00	75.00	602.141	51.170	-222.130	136.022	433.580	3.241	62.268	90.861	-12.094
	6.01	75.00	409.018	176.632	-75.785	217.709	336.319	-2.051	44.233	64.913	-10.514
	4.99	75.00	504.520	160.756	-68.438	224.582	271.771	20.640	65.310	52.185	-21.008
	4.01	75.00	600.869	205.406	-24.367	164.102	274.595	-42.681	79.662	-11.682	-74.232
	2.72	75.00	737.954	134.393	-184.252	185.213	278.497	6.588	44.000	-47.358	-34.056
	2.01	75.00	615.494	95.018	-58.835	120.374	241.365	.396	41.363	-99.401	-41.977
	1.29	75.00	549.224	51.938	96.693	85.572	247.444	2.810	11.069	-190.141	-101.023
	.61	75.00	599.583	90.837	-98.389	57.442	209.339	-4.916	-13.656	-211.639	7.398
	.00	75.00	538.433	3.630	-127.781	6.357	188.076	9.584	50.017	-142.312	-63.312

C FILENAME= H904A150.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	13.99	150.00	88.409	17.314	6.336	21.769	38.022	-1.616	5.307	21.516	-3.870
	12.00	150.00	51.915	16.482	3.257	5.637	22.672	-.898	7.856	10.103	-4.040
	10.01	150.00	49.379	12.475	15.470	.652	20.044	1.975	5.522	5.090	-7.812
	7.99	150.00	31.907	13.025	7.489	1.051	24.658	-.829	1.599	2.508	-2.920
	5.99	150.00	14.655	7.239	7.154	-6.056	8.974	2.752	.520	-8.287	-5.646
	3.98	150.00	1.962	4.027	10.470	-7.079	1.725	-1.657	-1.535	-6.961	-6.110
	2.01	150.00	9.025	2.670	4.973	1.069	5.065	-2.484	-2.633	-10.198	-10.916
	1.00	150.00	-4.618	2.686	-2.305	2.226	-.036	.415	.456	-11.408	-10.865
	.01	150.00	3.273	3.398	7.307	5.199	-.162	.442	-1.480	-16.259	-9.154

C FILENAME= H904A225.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
	18.00	224.99	8.629	3.213	5.468	.059	5.452	.055	-1.305	-2.937	1.445
	16.00	224.99	14.566	6.529	18.224	4.117	8.021	-.004	1.794	2.929	-.337
	13.99	224.99	9.662	3.564	7.045	-1.925	3.092	.988	.739	-.074	-4.843
	12.00	224.99	7.053	1.613	5.031	.527	4.634	-1.551	-.399	-1.531	-1.780
	10.01	224.99	7.805	1.842	14.391	.148	5.085	.477	-1.147	-6.187	-3.632
	7.99	224.99	2.671	.992	5.677	-2.171	4.382	1.255	-1.259	-1.173	-1.593

5.99	224.99	11.018	-1.627	3.686	-.484	2.333	1.219	-2.278	-4.618	-.650
3.98	224.99	7.750	-.989	2.024	-1.332	1.720	.451	.549	-4.284	-1.710
2.00	224.99	4.142	-.623	7.522	-1.375	2.366	1.381	-1.493	-2.895	-2.201
.00	224.99	3.945	-1.530	9.554	1.106	2.582	2.153	-2.147	-3.146	.458

C FILENAME= H904A001.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090493

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
13.49	1.50	-5.925	-23.285	-83.472	-13.710	-10.402	-8.620	-12.826	1.858	-6.755	
13.01	1.50	-1.850	-9.462	-15.717	-4.878	-2.859	-2.921	-6.728	-.375	-1.563	
12.51	1.50	-.105	-8.164	-3.061	-1.330	-1.533	-2.616	-2.903	.381	-.482	
12.01	1.50	.171	-5.943	-1.956	-.475	-1.297	-2.257	-1.285	.225	-.327	
11.19	1.50	-.182	-2.405	-.682	.173	-.074	-1.348	.053	.212	-.653	
10.40	1.50	-.769	-.651	-1.647	1.119	-.420	-1.547	2.229	-1.165	-.984	
9.60	1.50	-4.144	1.820	.926	2.140	-2.423	-.783	.149	-2.538	-1.856	
8.20	1.50	-35.480	3.120	-5.566	7.283	-6.896	-.404	.066	-5.885	-6.239	
6.99	1.50	-9.735	5.240	-7.746	3.307	-6.035	.876	1.198	-2.116	3.235	
6.01	1.50	4.307	-.256	6.627	-1.304	-3.151	.797	.841	-2.373	6.300	

C FILENAME= H904A010.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 9 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
18.00	9.99	15.149	-21.878	22.540	6.080	-1.053	1.370	15.604	3.048	1.249	
16.00	9.99	-52.885	-63.400	-46.111	-46.909	-44.958	-19.694	-12.152	-10.675	-19.312	
13.99	9.99	-1.385	-14.211	-8.908	-4.748	-4.110	-4.103	-3.065	-.375	-1.387	
13.02	10.00	-3.993	-4.179	-7.836	.001	-.097	-.463	1.453	-3.514	-4.069	
11.98	10.00	-8.503	-.222	-.475	-1.211	-.488	-.310	-1.282	-.913	-3.439	
11.01	10.00	-17.079	-.340	3.332	-2.994	-2.440	-.042	-1.753	-2.701	-3.724	
10.00	10.00	-15.989	-1.134	-2.488	-5.148	-5.293	-.310	-.287	-3.701	-1.942	
9.01	10.00	-27.138	-5.786	-1.832	-13.130	-11.144	-.888	.422	-1.793	.500	
8.01	10.00	-40.316	-15.348	.585	-18.341	-34.702	-.254	-.781	-8.716	6.007	

C FILENAME= H904A025.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 15 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
24.00	25.00	28.143	15.751	19.350	15.485	9.112	7.334	19.208	1.407	1.896	
23.00	25.00	19.765	9.824	6.484	9.058	6.452	4.694	6.174	3.471	2.082	
22.00	25.00	7.106	-8.662	-3.983	-.639	-10.410	-1.454	-1.337	-1.539	5.145	
21.00	25.00	-29.516	-40.500	-22.988	-19.761	-25.314	-11.912	-3.984	-8.884	-9.016	
20.00	25.00	-43.304	-30.721	-25.837	-30.203	-34.511	-9.651	-14.395	-18.837	-10.514	
19.00	25.00	-58.178	-59.012	-29.484	-42.743	-47.637	-18.753	-14.263	-18.803	-13.220	
18.01	25.00	-39.031	-46.437	-30.429	-36.616	-43.162	-17.986	-11.454	-12.044	-9.618	
16.98	25.00	-24.926	-41.502	-14.870	-21.814	-28.081	-10.134	-10.576	-7.704	-8.116	
16.01	25.00	-14.434	-34.318	-6.744	-7.959	-15.139	-5.939	-3.383	-3.899	-5.548	
14.99	25.00	-15.050	-22.616	-3.679	-3.402	-5.010	-1.129	-1.147	-4.037	-6.121	
14.01	25.00	-20.698	-16.280	-3.421	-5.376	.100	-1.124	-.747	-2.609	-4.757	
13.01	25.00	-21.905	-13.500	-1.857	-4.922	1.046	-1.586	.710	-1.293	-1.036	
12.00	25.00	-37.943	-15.203	-4.499	-10.749	-8.111	-2.982	-2.277	-5.547	3.035	
11.01	25.00	-15.850	78.862	-2.335	5.851	-50.609	1.134	10.146	-13.087	8.127	
10.99	25.00	-13.486	13.453	3.657	-2.183	-22.945	-4.717	5.868	-12.300	11.965	

C FILENAME= H904A050.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	50.01	-2.568	-2.218	-8.777	-4.633	-8.459	-3.432	-4.625	-2.815	-1.879	

24.00	50.01	-11.799	-5.122	-9.852	-7.777	-9.499	-3.256	-6.714	-5.293	-5.003
22.00	50.01	-10.761	-1.084	-7.424	-6.959	-11.043	-3.590	-5.923	-5.022	-3.975
20.00	50.01	-9.185	-9.749	-8.541	-5.138	-11.228	-4.891	-4.496	-4.877	-3.908
18.00	50.01	-11.830	-9.245	-10.233	-3.064	-8.083	-4.810	-4.508	-2.785	-.884
15.99	50.01	-5.843	-6.655	-8.959	-2.698	-4.773	-2.769	-2.617	-3.202	-1.199
15.01	50.01	-9.020	-3.571	-6.577	.867	-5.602	-1.670	-1.479	-3.375	-3.376
14.01	50.01	-10.020	-1.545	-8.092	1.257	-3.334	-1.742	-1.865	-3.540	-1.935
13.00	50.01	-7.186	-.185	-7.561	2.141	-4.152	-1.193	-1.391	-3.447	-2.811
12.00	50.01	-12.936	3.241	-6.242	3.776	-3.340	.994	1.382	-2.123	-1.842
11.01	50.01	-3.329	7.539	-3.254	4.579	.777	2.383	2.798	-.946	.125
9.99	50.01	6.082	9.681	-.559	3.114	2.330	5.152	5.756	1.600	-1.403
9.00	50.01	66.759	63.112	40.614	30.534	39.933	24.495	37.713	39.893	11.878
8.00	50.01	1482.532	554.266	108.120	626.203	494.268	85.488	288.449	401.674	17.732

C FILENAME= H904A075.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 18 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	75.00	.590	-3.416	-1.976	-2.414	-4.236	-2.267	-2.139	-2.196	-.632	
24.00	75.00	-1.013	-1.456	-4.800	-1.586	-2.741	-.902	-3.070	-.721	-.381	
22.00	75.00	-.408	-2.902	-3.131	-2.390	-3.300	-2.032	-2.456	-.768	-.317	
21.00	75.00	.237	-3.340	-2.403	-1.896	-2.666	-1.502	-1.787	-.556	-.655	
20.00	75.00	-.948	-1.819	-2.080	-.909	-1.776	-1.622	-1.057	-.935	-1.398	
19.00	75.00	.585	-2.369	-2.375	-1.359	-1.704	-2.018	-2.947	-.113	-1.065	
18.01	75.00	-2.955	-2.027	-2.135	-.663	-1.487	-1.526	-1.455	-.147	-.946	
15.99	75.00	-1.191	-2.001	-3.036	-.381	-.243	-1.061	-.642	-.938	-1.338	
13.99	75.00	3.261	3.248	-4.368	2.775	1.783	-1.264	.117	1.164	-1.385	
11.99	75.00	5.033	3.590	-4.230	1.486	3.448	1.457	.491	2.645	-1.961	
11.01	75.00	23.011	5.292	-3.766	5.996	6.248	3.694	3.568	7.754	2.213	
9.99	75.00	105.041	23.111	7.264	24.183	33.946	15.162	24.259	50.218	4.970	
9.00	75.00	587.502	102.217	42.093	168.146	152.955	30.742	79.041	146.718	7.658	
8.00	75.00	1262.213	298.215	-15.012	435.133	359.142	17.150	151.681	278.394	-2.199	
5.99	75.00	1524.565	511.607	-83.222	539.558	517.528	24.770	203.558	308.123	-67.599	
5.01	75.00	1358.027	568.282	-237.542	384.595	420.032	48.337	222.952	251.700	-13.294	
4.00	75.00	1475.883	413.008	-267.594	295.475	259.708	22.557	162.566	124.919	-109.576	
3.02	75.00	1280.919	466.983	-212.306	142.659	135.473	-.824	150.240	19.238	-106.106	

C FILENAME= H904A150.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	149.99	-.048	-.717	-.820	-.628	-.565	-.092	-.611	-.396	.195	
24.00	149.99	.101	-.691	-.894	-.390	-.368	-.320	-.428	.079	-.130	
22.00	149.99	.704	-.327	-.636	-.477	-.357	-.202	-.335	.241	.247	
20.00	149.99	2.528	-.300	-.604	.145	.217	.047	-.140	.749	.753	
18.00	149.99	6.034	.535	.133	.881	.968	.605	.274	2.207	.762	
16.00	149.99	25.246	2.491	2.485	4.920	4.245	1.794	1.747	7.544	4.873	
13.99	149.99	89.544	9.160	4.978	22.390	20.418	-.181	7.196	19.436	.464	
12.00	149.99	186.414	41.903	3.688	62.390	52.418	6.030	18.022	40.489	2.177	
10.01	149.99	182.300	46.459	2.556	61.187	56.076	3.951	25.547	45.144	10.518	
7.99	149.99	136.887	47.434	-10.718	33.851	44.106	.318	23.042	29.638	-7.971	
5.99	149.99	97.374	46.881	-2.409	21.511	31.553	1.650	22.658	15.455	2.219	
3.98	149.99	67.483	28.292	-2.303	5.764	14.848	-2.320	12.256	-.869	9.312	
2.01	149.99	44.979	18.055	-4.916	-10.874	-3.203	-1.115	5.904	-3.168	6.192	
.00	149.99	26.562	16.224	-11.621	-8.923	-13.506	-.689	5.930	-19.366	3.623	

C FILENAME= H904A225.A_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO ANNULUS FLUID ONLY.

C D090894

C 14 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	224.99	2.036	.624	.580	.307	.675	.431	.709	1.060	.654	
24.00	224.99	6.419	.669	1.455	1.621	1.059	.367	1.049	2.209	1.353	

22.00	224.99	10.805	.950	1.760	2.267	1.726	.925	.868	2.990	2.687
20.00	224.99	26.326	2.649	3.384	6.311	4.665	1.347	2.158	5.814	3.248
18.00	224.99	44.906	3.981	3.716	11.236	7.868	2.219	3.708	9.071	4.559
15.99	224.99	71.961	7.448	3.598	19.708	13.475	2.624	4.242	12.121	7.385
13.99	224.99	63.103	13.968	6.541	19.062	17.207	1.073	6.915	16.098	6.046
11.99	224.99	61.213	14.681	4.177	18.286	18.125	.526	6.971	12.562	6.871
9.99	224.99	30.598	14.387	5.400	7.348	13.563	1.764	6.695	9.724	2.896
7.99	224.99	19.353	13.860	1.856	.755	9.210	.296	4.509	7.989	5.047
5.99	224.99	24.377	8.534	5.934	6.089	3.871	.908	2.152	2.067	-1.692
3.98	224.99	10.643	5.631	5.181	-3.297	1.010	-.373	3.278	-.562	.021
2.01	224.99	6.313	6.161	4.476	-5.260	-2.772	.371	.778	-1.735	.921
.00	224.99	3.772	2.779	3.847	-.170	-.672	1.060	2.862	-2.406	-3.484

C FILENAME= H904A001.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	1.50	.002	.004	.010	.002	.000	.003	.005	.001	.003	
24.00	1.50	-.003	.001	.008	.002	-.001	.002	.002	.002	-.002	.001
22.00	1.50	-.004	.002	.006	.004	-.003	.002	.001	.001	-.003	.006
20.00	1.50	-.005	.004	.010	.002	-.004	.002	.005	.005	-.003	.005
18.00	1.50	-.052	-.008	.003	.011	-.011	.001	.014	.014	-.010	.000
16.00	1.50	-.187	1.777	7.318	.177	-.346	1.135	.194	.073	.164	
15.01	1.50	47.760	87.021	122.296	37.476	44.052	30.608	17.284	11.561	22.721	
14.01	1.50	-22.662	19.084	-56.151	-10.885	-1.843	.629	1.372	-.495	-4.107	

C FILENAME= H904A010.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 8 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	10.00	-.009	.004	.006	.002	-.006	.002	.005	-.003	.000	
24.00	10.00	-.034	-.011	.013	.006	-.017	-.006	.007	-.006	-.004	
22.00	10.00	-.191	.070	-.038	.028	-.136	-.034	.029	-.084	-.040	
20.00	10.00	.293	1.687	1.530	.295	.346	.814	.336	-.312	.476	
18.00	10.00	56.456	86.368	62.111	39.947	45.382	41.109	24.155	14.490	17.706	
16.00	10.00	-33.263	9.733	-37.281	-25.004	-16.959	2.167	-8.660	-5.029	-5.941	
15.01	10.00	-38.814	-13.660	-45.635	-23.058	-18.064	-8.832	-16.744	-11.494	-3.107	
14.00	10.00	-28.933	-18.602	-31.308	-20.766	-19.040	-4.176	-8.800	-4.879	-3.905	

C FILENAME= H904A025.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 7 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	25.00	1.337	4.848	1.869	1.580	.792	1.790	2.314	.081	.256	
24.00	25.00	37.077	56.721	30.772	26.391	32.207	21.552	21.005	16.950	11.670	
22.00	25.00	67.380	94.810	41.047	42.701	48.308	21.473	19.177	18.620	15.777	
20.00	25.00	15.244	53.678	-2.579	13.348	17.143	9.521	1.356	-4.018	4.575	
18.00	25.00	-23.373	17.598	-13.758	-11.960	-11.977	-4.780	-5.423	-6.073	-4.374	
15.99	25.00	-25.913	-6.765	-16.906	-18.931	-22.473	-5.167	-9.582	-6.800	-4.369	
13.99	25.00	-25.144	-4.769	-10.801	4.431	-7.538	-1.614	-1.629	-7.692	-6.558	

C FILENAME= H904A050.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 11 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	50.00	21.025	37.468	3.658	10.320	12.806	6.739	5.253	4.758	2.182	
24.00	50.00	9.394	25.371	-.027	1.702	-.090	2.730	2.298	.482	-1.257	
22.00	50.00	5.222	12.221	-4.962	-2.538	-4.737	1.233	.306	-2.261	-2.764	
20.00	50.00	-5.037	2.970	-4.188	-2.904	-7.280	-4.468	-2.054	-1.767	-1.628	

18.00	50.00	-5.709	2.050	-7.401	-2.767	-8.440	-2.735	-2.317	-4.538	-2.480
17.00	50.00	-3.331	2.765	-5.623	-.430	-6.552	-3.665	-1.115	-2.353	-1.092
16.01	50.00	-8.717	.593	-10.185	1.844	-9.456	-2.203	-1.279	-3.145	-2.675
14.99	50.00	-16.327	-.389	-8.967	5.318	-3.767	-1.138	-1.331	-2.668	-4.981
14.01	50.00	-9.746	1.204	-5.939	4.580	-5.277	-3.366	.192	-1.204	-5.179
13.00	50.00	-6.597	2.290	-8.426	6.442	-3.097	-1.171	1.019	-2.374	-4.111
12.00	50.00	-.259	3.458	-11.245	5.269	-1.640	-4.263	.398	-3.027	-5.386

C FILENAME= H904A075.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 15 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	75.00	.373	6.618	-1.314	-.103	-2.065	-.597	-1.936	-.466	-1.314	
24.00	75.00	-2.670	-.998	-4.176	.471	-5.885	-3.170	-3.087	-1.330	-1.587	
22.00	75.00	-.549	.545	-3.491	-.307	-3.042	-1.723	-2.585	-.417	.470	
20.00	75.00	-6.023	-3.945	-2.064	.132	.708	-4.920	-1.883	-2.363	-.092	
19.00	75.00	-2.250	1.254	-3.341	.777	-2.057	-1.068	-2.043	.642	-.797	
18.01	75.00	-3.151	-.808	-2.671	.792	-.961	-1.930	-1.436	-1.364	-1.842	
17.00	75.00	-2.196	.848	-3.514	1.069	-.970	-.587	-.988	.051	-1.536	
16.00	75.00	-.932	.250	-4.067	.013	.479	-1.095	-2.097	-.714	-1.185	
15.01	75.00	-.151	1.867	-3.466	1.006	1.343	-1.415	-1.349	.462	-.689	
14.01	75.00	-1.981	1.302	-4.178	1.808	1.652	-1.410	-.358	.083	-2.204	
13.01	75.00	3.799	4.388	-5.162	2.942	4.580	.739	1.847	1.255	-.264	
12.00	75.00	12.068	5.260	-2.774	2.850	4.409	1.940	2.920	3.409	-1.330	
11.01	75.00	22.515	9.612	-6.491	6.829	11.762	3.529	6.108	7.994	-1.430	
9.99	75.00	88.565	15.632	-7.920	17.310	18.623	4.399	12.292	39.071	.853	
9.01	75.00	312.236	42.803	-41.544	63.525	72.571	2.144	41.222	87.004	-18.839	

C FILENAME= H904A150.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 6 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	150.00	1.466	-.017	-.369	.454	.176	-.220	-.155	.798	-.077	
24.00	150.00	.801	.112	-.306	-.063	-.154	.147	-.029	.372	-.385	
22.00	150.00	1.077	.250	.324	.435	.336	.078	.220	.463	.338	
18.00	150.00	19.978	2.796	1.446	3.584	4.292	.631	1.455	4.615	.208	
16.00	150.00	50.593	5.520	-1.398	13.541	10.015	1.132	4.317	11.558	1.191	
13.99	150.00	131.633	24.685	-3.438	39.477	30.591	.773	9.948	22.168	-7.519	

C FILENAME= H904A225.E_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C LDV SEED PARTICLES ADDED TO EXTERNAL FLUID ONLY.

C D090894

C 10 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
26.00	224.99	4.670	.982	-.095	-.215	.666	.690	.775	1.909	.045	
24.00	224.99	23.052	2.560	-.008	5.083	3.948	.793	1.936	5.454	1.599	
22.00	224.99	20.261	2.947	.872	4.561	3.967	1.325	1.690	3.801	.402	
20.00	224.99	43.355	6.714	-.067	12.228	9.785	1.021	2.428	7.914	-.319	
18.00	224.99	41.803	11.957	-1.384	11.728	12.351	1.346	3.423	6.735	-.839	
15.99	224.99	26.213	13.479	-2.712	7.300	11.342	.405	4.840	8.233	-1.768	
13.99	224.99	15.892	11.733	-.465	5.236	8.511	.096	2.861	5.615	3.540	
11.99	224.99	34.894	10.173	-1.327	9.680	10.438	.060	3.571	5.945	1.188	
10.00	224.99	11.088	8.105	-.766	3.773	5.817	-1.385	3.067	1.866	3.008	
8.00	224.99	10.024	4.208	-4.123	1.280	.678	.099	2.553	1.777	4.672	

C FILENAME= H904AAX.J_2

C

C H2 FLAME; d=9.45, delta=1.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; y=0 mm

C LDV SEED PARTICLES ADDED TO JET FLUID ONLY.

C D090894

C 22 : No. of data points

C	y	x	u'^3	v'^3	w'^3	u'^2v'	v'^2u'	v'^2w'	w'^2v'	w'^2u'	u'^2w'
.00	1.50	-96.780	-15.799		5.647	-14.518	-59.957	3.293	.294	-9.571	3.772

.00	10.00	-126.950	-22.548	2.528	-18.440	-66.413	1.838	-5.289	-17.162	-6.330
.00	20.00	-263.847	-75.136	22.372	-59.740	-184.356	35.293	-21.457	-40.347	31.191
.00	30.00	-2372.275	-255.725	271.859	-435.568	-1080.690	111.003	-17.317	-302.969	225.222
.00	40.01	-3424.759	-255.961	82.782	-372.150	-1077.115	84.062	42.975	-505.530	362.229
.00	50.00	-584.645	-34.839	-72.670	-240.753	-441.104	57.280	-43.838	-567.125	80.701
.00	60.01	735.500	34.866	-257.312	33.931	179.685	39.390	9.474	-321.682	-27.680
.00	70.00	926.892	156.672	-298.232	83.900	300.507	22.463	-15.137	-279.047	-98.514
.00	80.00	405.467	43.339	-64.024	-.060	138.876	32.352	-2.082	-34.209	14.190
.00	90.00	219.090	51.235	-32.551	-3.266	98.791	-19.290	-22.307	-38.885	15.245
.00	100.00	122.708	9.264	-10.592	16.593	66.380	-23.160	-1.171	-52.330	-3.251
.00	110.00	39.755	1.838	-14.223	30.987	22.578	-9.707	4.413	-39.521	-31.580
.00	120.00	10.716	3.987	-27.493	-2.284	11.334	-7.567	-2.461	-39.861	-18.141
.00	130.00	35.163	14.961	-13.017	18.005	4.127	2.351	1.216	-17.454	-17.089
.00	140.00	-13.689	7.401	-5.756	-.666	2.515	1.662	-.001	-10.957	.899
.00	150.01	-14.053	.077	3.621	1.364	3.852	.990	-1.904	-13.581	-2.605
.00	160.00	11.102	1.254	11.550	2.003	1.245	1.384	5.418	-5.086	-9.912
.00	170.01	30.958	7.538	25.172	5.765	5.367	6.549	2.424	-2.985	-5.068
.00	180.00	3.659	.445	10.637	-2.078	1.862	-1.034	-1.283	-10.169	-7.494
.00	190.01	6.798	-.692	8.668	.151	2.808	1.762	.044	-6.661	-1.660
.00	200.01	4.588	.934	15.714	2.265	-1.008	-1.709	-.296	-7.326	.542
.00	224.99	6.114	.331	19.360	.644	2.296	.939	.638	-2.803	-1.357

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=1.5 mm

C D062394

C 10 : No. of data points

C

C y x T SIGt'

4.5	1.5	1456	91
5.0	1.5	1645	193
5.5	1.5	1603	483
5.75	1.5	1389	624
6.0	1.5	1123	654
6.25	1.5	937	633
6.5	1.5	691	525
7.0	1.5	450	313
7.6	1.5	329	74
8.8	1.5	315	41

C FILENAME= H904A010.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=10 mm

C D062394

C 8 : No. of data points

C

C y x T SIGt'

6.0	10	1615	146
6.5	10	1716	171
7.0	10	1827	253
8.2	10	1776	403
8.8	10	1525	617
9.6	10	959	650
10.4	10	623	471
11.2	10	400	221

C FILENAME= H904A025.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=25 mm

C D062394

C 13 : No. of data points

C

C y x T SIGt'

8.2	25	1580	116
8.8	25	1595	114
9.6	25	1633	141
10.4	25	1677	150
11.2	25	1761	209
12.0	25	1776	364
12.8	25	1654	558
13.4	25	1460	641
14.0	25	1618	480
14.7	25	814	618

15.5	25	598	473
16.5	25	407	235
17.7	25	340	88

C FILENAME= H904A050.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=50 mm

C D062394

C 16 : No. of data points

C

C y x T SIGt'

9.6	50	1528	349
10.4	50	1664	223
11.2	50	1546	425
12.0	50	1485	480
12.8	50	1670	305
13.4	50	1615	340
14.0	50	1365	595
14.7	50	1631	369
15.5	50	1446	578
16.5	50	1083	641
17.7	50	902	625
19.0	50	778	560
20.5	50	587	440
22.0	50	532	378
23.5	50	443	282
25.0	50	388	180

C FILENAME= H904A075.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=75 mm

C D062394

C 19 : No. of data points

C

C y x T SIGt'

8.8	75	1573	279
9.6	75	1604	295
10.4	75	1605	294
11.2	75	1578	334
12.0	75	1583	407
12.8	75	1534	420
13.4	75	1482	469
14.0	75	1418	521
14.7	75	1376	530
15.5	75	1309	536
16.5	75	1277	567
17.7	75	1191	566
19.0	75	1421	390
20.5	75	1012	559
22.0	75	884	543
23.5	75	762	495
25.0	75	669	439
26.5	75	553	350
28.0	75	535	331

C FILENAME= H904A150.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=150 mm

C D062394

C 15 : No. of data points

C

C y x T SIGt'

0.0	150	1604	98
1.3	150	1619	104
2.7	150	1635	117
4.5	150	1637	119
6.0	150	1637	137
7.6	150	1646	152
9.6	150	1630	218
11.2	150	1650	185
13.4	150	1659	214

14.7	150	1606	373
16.5	150	1719	269
19.0	150	1661	309
22.0	150	1420	557
25.0	150	1166	594
28.0	150	1005	555

C FILENAME= H904A225.T

C

C H2 FLAME; d=9.45, delta=0.2 mm; theta=45 deg.; Uj=100, Ua=20, Ue=4 m/s; x=225 mm

C D062394

C 15 : No. of data points

C

C	y	x	T	SIGt'
	0.0	225	1629	121
	1.3	225	1636	177
	2.7	225	1669	116
	4.5	225	1680	130
	6.0	225	1664	127
	7.6	225	1666	122
	9.6	225	1669	166
	12.0	225	1694	210
	13.4	225	1692	181
	14.7	225	1676	316
	16.5	225	1690	270
	19.0	225	1681	376
	22.0	225	1559	468
	25.0	225	1420	548
	28.0	225	1257	539